

AUTOMOTIVE INDUSTRIES

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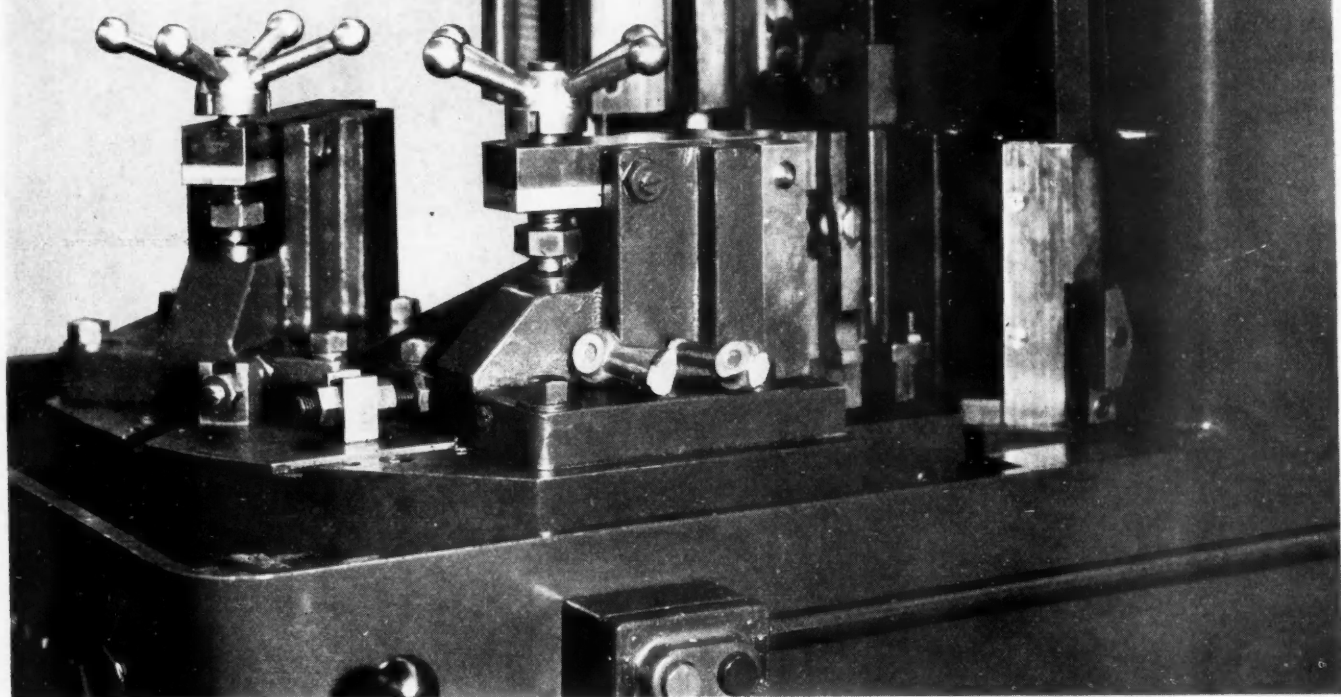
Automotive Industries

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February 4, 1939

AUTOMOTIVE INDUSTRIES, Vol. 80, No. 5. Published weekly by Chilton Co., Chestnut & 56th Sts., Phila. Entered as Second-Class Matter October 1, 1925, at the Post Office at Philadelphia, Pa.; Under the Act of Congress of March 3, 1879. In Case of Non-Delivery Return Postage Guaranteed. Subscription price: United States, Mexico, United States Possessions, and all Latin-American countries, \$1.00 per year. Canadian and Foreign, \$2.00 per year; single copies, 25 cents, except Statistical Issue (Feb. 26, 1939), 50 cents.

**SIX SURFACES
AT ONE STROKE**
including both ends



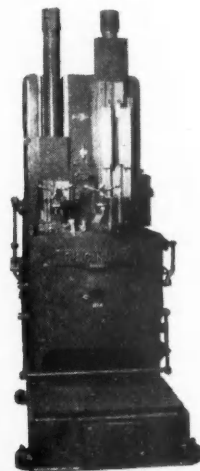
SIX surfaces, including both ends of the part, in one stroke of the ram. That's the way rocker shaft supports are broached on this CINCINNATI No. 2-36 Duplex Vertical Broaching Machine. The operator merely loads and unloads the fixture, and the part goes on its way to the next machine, with both sides of two bosses and both ends finished to exact dimensions.

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AUTOMOTIVE INDUSTRIES



CHARLES B. BOHN

... president of the Bohn Aluminum & Brass Corp., who has been elected president of the Aluminum Association to succeed Arthur Vining Davis.

New Orders For Mack Trucks, Inc.

Mack International Motor Truck Corp. received orders totaling \$1,500,000 within the past few days. Included in this amount were orders for 75 buses from the Brooklyn Bus Corp., 57 buses from the Lehigh Transit Co., 16 buses from the Bronx-Flushing Corp., 10 buses from the Virginia Electric & Power Co. This is in addition to the order for 50 buses announced a short while ago from The W. F. Transportation Co. of New York to cost over \$500,000.

GM-Cornell Price Index

The General Motors-Cornell World Price Index of 40 basic commodities for the week ended Jan. 21 was 60.9, compared with the revised figure of 61.1 for the previous week. The United States index in gold was 63.2, compared with 64.0 for the preceding week.

Automotive Industries

Weather Affects Week's Output

*January Production
Near 370,000 Units*

Showing only a slight reaction to seasonal factors, car and truck production for the week ending Feb. 4 was expected to be somewhat lower than the totals maintained during preceding weeks with heavy snowfall in the northern tier of states also playing a part in bringing about the reduction.

According to a mid-week survey of factory schedules, approximately 80,000 cars and trucks came off final assembly lines during the week. Affecting the week's total was loss of a day's production at Plymouth and Dodge because overland transportation facilities were so crippled by snow-bound routes that finished cars could not be carried away rapidly enough to permit assembly lines to operate smoothly. The week would have shown some decline from the previous rate anyway, but the drop would not have been as great by several thousand units.

Production in all plants appears to continue to be geared closely to sales and the current production rate is definitely reflecting unfavorable selling weather. Shipments are continuing to be made against banks of unfilled orders although dealers are not ordering beyond immediate needs, a condition which is reflected in field stocks of both new and used cars—both of which are well below the highs in effect at this time last year. The seasonal trend is indicated in sales reports for the second 10 days of January, which are well ahead of the same period of last year but slightly below the corresponding period in December.

Based on the total production for the current week, which included the last two days of January, it now appears that total production during the first month of the year was approximately 370,000 cars and trucks. This represents an increase of better than 60 per cent over January, 1938.

General Motors divisions were expected to account for approximately 32,000 cars and trucks during the week, followed by Ford with almost 23,000 and Chrysler divisions with almost 17,000. Independents, with the excep-



M. J. GOLDEN

... who has resigned as director of sales, Chrysler Corp., to accept the position of sales manager of Willys-Overland. Mr. Golden has been associated for the past seven years with Joseph W. Frazer, new president of Willys-Overland.

tion of Willys, continued on about the same basis as previous weeks with the latter scheduling no final assemblies for the week.—J.A.L.

Oehler Again Heads Automotive Electric

E. V. Oehler, vice-president and general sales manager of the Briggs & Stratton Corp., was reelected president of the Automotive Electric Association at the annual convention held in conjunction with the third annual Distributors Conference in Detroit, Jan. 28-Feb. 3.

Other officers of the association, all reelected, are F. B. Willis, Bendix Products division Bendix Aviation Corp., manufacturer vice-president; G. J. Beattie, Auto Electric Service Co., Toronto, distributor vice-president; G. S. Cole, Leece-Neville Co., secretary-treasurer. A. R. Sandt continues as executive secretary.

February 4, 1939

Australia's Hope for Domestic Car Industry Dimmed by Tariff Policy

Government Has Invited Engine And Chassis Makers to Submit Proposals

With the Australian government definitely interested in the establishment of domestic plants for the production of automobile engines and chassis, the stumbling block to the realization of its hopes of attracting foreign or Australian companies to such a project seems to have been the country's indefinite tariff policy. This was pointed out in an editorial in a recent issue of *The Australasian Manufacturer*.

Approximately two and a half years ago the Commonwealth Government invited the Tariff Board to investigate the best means of giving effect to the government's policy of establishing in Australia the manufacture of engines and chassis for motor vehicles. The board's report, submitted last October, expressed the opinion that it would be unwise at present to encourage or enforce the manufacture of complete motor cars. The report, described as "inept and vague," was tabled in the Australian House of Representatives by the Minister for Customs, Mr. White, who said, "the government adheres to the policy of encouraging the establishment of an industry for the manufacture of engines and chassis in Australia. The government invites prospective manufacturers of engines and chassis, or parts thereof, to submit their proposals, with details of the assistance required, not later than March 31, 1939. Consideration will be given to any proposal for complete manufacture." By "assistance" is meant the proposed bounty of approximately \$150 per unit to be offered the manufacturer.

Following Mr. White's statement, the Federal Treasurer announced that the government was considering removal of the present duty on chassis. This was considered a direct threat to take away

the only sure means by which the motor car industry could be established. "If the government wants definite proposals," said *The Australasian Manufacturer*, "it must itself adhere to a definite policy. The imperative need of the moment is that the government stands firm—that it rigidly adheres to its promise of adequate protection for this great and important industry."

Mr. White said investigations in Great Britain gave rise to the hope that some offers would be made by British interests. After next March it was stated, proposals placed before the government would be considered and assistance granted to any that were considered economically sound.

Stewart Motor Corp. is Disposing of Inventory

The Stewart Motor Corp. whose stockholders are scheduled to vote Feb. 14 on a proposal to liquidate the company, has begun to dispose of surplus stocks of materials which had been used in the manufacture of motor trucks, including the various grades of hardwood lumber and steel sheets used in the construction of automobile bodies.

Foy Made Director Of United Aircraft

Byron C. Foy, vice-president of the Chrysler Corp. and president of the De Soto Motor Corp., has been elected to the board of directors of United Aircraft Corp.

The other members of the board of

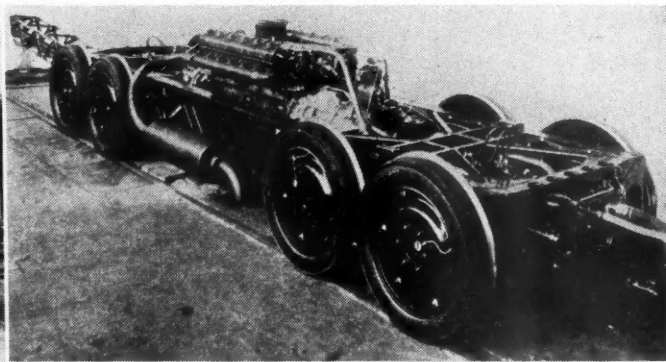
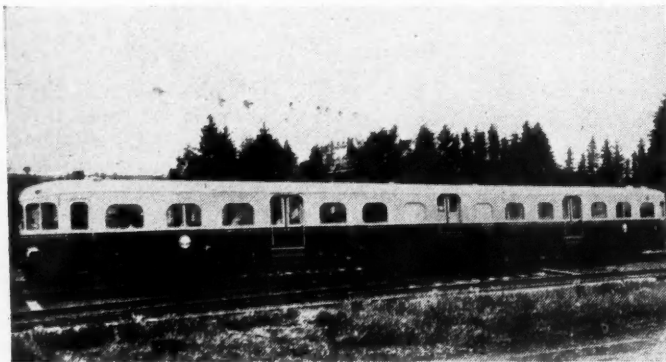
United Aircraft Corp. are Frederick B. Rentschler, chairman; Donald D. Brown, president; Eugene E. Wilson, senior vice-president; George J. Mead, vice-president and chief engineer; Joseph F. McCarthy, controller and secretary; Raycroft Walsh, vice-president and general manager of the Hamilton Standard Propellers Division; Rensselaer W. Clark, vice-president and general manager of the Chance Vought and Sikorsky Aircraft Divisions; J. Carlton Ward, Jr., vice-president and general manager of the Pratt & Whitney Aircraft Division; Peter M. Fraser, vice-president, Connecticut Mutual Life Insurance Co.; William B. Mayo, president, Chicago, Duluth and Georgian Bay Transit Co.; Edward O. McDonnell, G. M. F. Murphy & Co., and Harry G. Stoddard, president, Wyman-Gordon Co.

Auburn Mfg. Will Expand

Auburn Mfg. Co., Auburn, Ind., makers of clutch units for automobiles, tractors and stationary engines, has announced the installation of \$100,000 worth of punch presses, production lathes and other equipment in the former Sterlite Foundry building, utilizing 22,000 sq. ft. of space.

Louis Baudry de Saunier

Louis Baudry de Saunier, a pioneer French writer on automobiles, author of numerous books on bicycling and motoring, and publisher of the French monthly *Omnia* died in Paris recently, aged 73. He was the first editor of the magazine of the Touring Club de France. During the early bicycle era, from 1891 to 1894, he wrote a number of books on the bicycle and bicycling. In 1895, with the advent of the automobile, he transferred his activities to the new field and wrote a comprehensive work on *L'Automobile Théorique et Pratique*, the two volumes of which appeared in 1897 and 1900 respective-

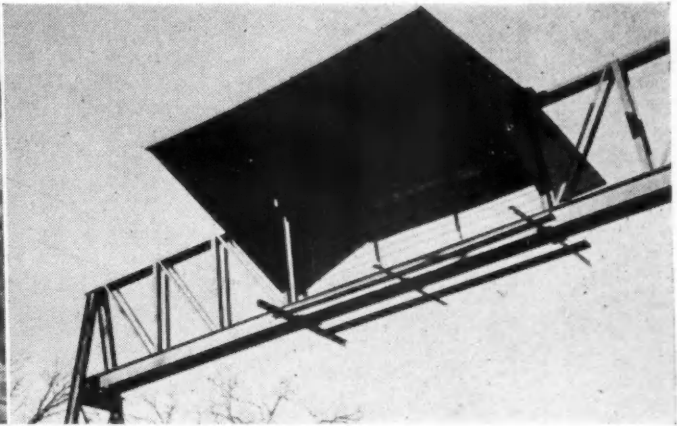
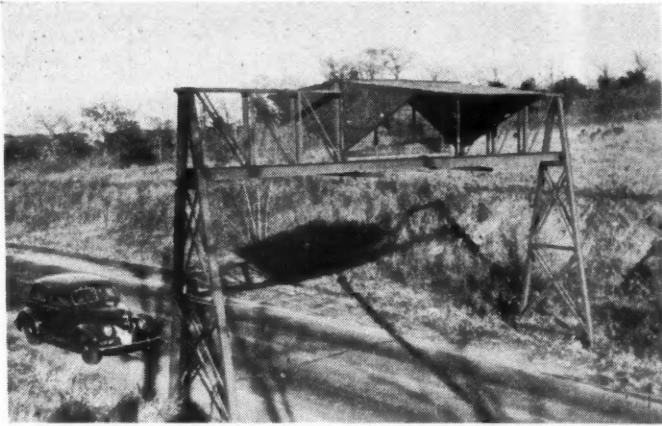


Acme

Rubber-Tired Train

This rubber-tired train, called the Autorail Michelin, will be brought from France and placed on exhibit at the New York World's Fair. At the left is a view

of the coach which has a seating capacity for 100 persons. The 400 hp. Panhard engine used to power the train is shown at the right.



Traffiscope

Something new in traffic safety devices is the "Traffiscope," shown above, designed to permit motorists to see oncoming traffic over the crests of dangerous hills. It has been installed on a Minnesota highway outside of Minneapolis. The rectangular-shaped lens consists of a number of long narrow prisms mounted one atop the other. The overhill image is not mirror-

reflected, but refracted or bent by means of the prisms to give motorists approaching the summit from either side of a hill a clear view of traffic conditions ahead. Size of the Traffiscope archway and lens may be compared with the car shown in the photograph at the left. Closeup of the device at the right shows the prismatic lenses and metal awning.

ly; *Les Recettes du Chauffeur*, 1901; *Sa Majesté l'Alcool*, 1904, and *L'Allumage dans les Moteurs à Explosion*, 1905. For a while he was editor of *La Locomotion Automobile*, the first automobile periodical in the world; upon resigning from that publication he founded his own periodical under the title *La Locomotion*, and when he was restrained by the owners of *La Locomotion Automobile* from using that title he changed it to *Omnia*, under which name it has appeared ever since.

Baudry de Saunier was a clear and resourceful writer who did much to familiarize the French public with the working principles of the automobile, and with its care and maintenance.

Oldsmobile Retail Sales Continuing Upward Trend

Oldsmobile retail sales for the second 10 days of January totaled 3458 units, an increase of more than 73 per cent over the corresponding period of last year. Total retail sales for the first 20 days of January were 6641 cars. This is a gain of 78 per cent over the same period of 1938.

Used car sales for the second 10-day period of January also increased. Oldsmobile dealers sold 12,530 units compared to 9628 for the previous 10-day period. Stocks of used cars in hands of Oldsmobile dealers throughout the United States are more than 5000 cars lower than the stock on hand for the same period last year.

Differential Wheel Corp.

Stockholders of the Detroit Compensating Axle Corp. have approved a change in the name of the concern to the Differential Wheel Corp.

Slow Steel Sales Attributed To Uncertain Labor Situation

Heavier Purchases This Month By Automobile Makers Are Anticipated

Fill-in buying by automobile manufacturers is confidently looked for in the steel market to gradually give way this month to more representative tonnage commitments. Steel company sales managers attribute the slowness of automotive buyers in anticipating their nearby requirements more to uncertainty over the labor situation in the automobile industry than to any expectation of price concessions.

While the propensity of Government departments for asking the filling out of lengthy questionnaires hardly arouses much enthusiasm, gathering of data by the Department of Commerce and Federal Trade Commission regarding whether base prices constitute a fair index of steel costs to the buyer is coming in for considerable attention from steel consumers. To what extent extras and deductions affect the market picture, determined solely by the movement of base prices, often puzzles buyers.

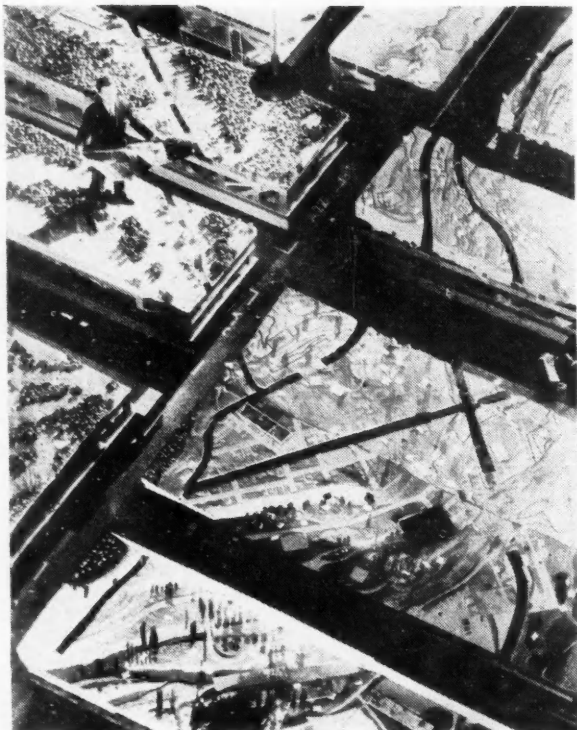
Administrator Walling of the Public Contracts Division of the Department of Labor has extended for one month the effective date of the order recognizing 62½ cents an hour as the minimum wage for steel producers, eligible to bid for public contracts under the Walsh-Healey act in the central and north-eastern area. The steel companies had asked a 60-day extension. The smaller steel companies are more hopeful that recognition will be accorded to their special status and problems. The sale of nearly 20,000 tons of heavy melting steel scrap to one of the large steel

companies at \$15 to \$15.50 is of interest because, while this price denotes an advance of approximately \$2 a ton over that prevalent a year ago, it is around \$3 a ton lower than that in vogue two years ago, when there was a spectacular export movement of scrap steel. The steel producers at that time shouldered the higher price they had to pay for scrap without advancing prices for their finished products. The more equable conditions in the scrap market at this time tend to hold steel producers' raw material costs on an even keel. Activity of finishing mills this week is thought to be slightly higher than the rate of employed ingot capacity, which, according to the American Iron & Steel Institute, has recovered.

(Turn to page 126, please)

Buick Registers Better Than Seasonal Advances

Buick moved forward in sales during the second 10 days of January, registering better than seasonal gains during the period and maintaining levels substantially above those a year ago. Domestic retail deliveries of Buick cars during the second January period totaled 4328 units, compared with 3626 in the first 10 days, and with 3033 in the corresponding period of 1938. A total of 9484 used cars were sold by Buick dealers during the period, against 7933 in the previous 10 days and 8249 a year ago.



Acme

Panorama

Norman Bel Geddes checks details of what is said to be the world's largest scale-model panorama at the New York World's Fair. This is the "Highways and Horizons" exhibit of General Motors, and was designed by Bel Geddes. Some of the 408 table panels which will cover a 30,000 sq. ft. area are shown here. The panorama will picture vistas of countryside, industrial and mountain sections, towns and cities, alive with moving cars, railroad trains and other animated objects. There also will be a conception of super-highways and traffic controls of the future.

GM Announces Labor Policy During Current UAW Strife

Will Not Negotiate Until Authority of Union Officers "Has Been Clarified"

Announcement by General Motors Corp. that "in view of the internal dissension existing among the officers of the United Automobile Workers union, no further negotiations will be entered into with any such officers until their position and authority have been clarified" was looked upon in Detroit as typical of the attitude being adopted by some manufacturers toward the dual set-up now existing in the ranks of the industry's major union.

"All local plant managers will continue to deal with their union shop committees of employees just as they have in the past," the General Motors statement continues. "Until such time as the differences between the union officers are settled, any grievances not settled with the local management may be appealed in writing by the chairman of the shop committee to the next higher corporation authority. Such appeal cases will be heard at the plants where the complaints arise, if possible.

"If the shop committee desires the presence of international representatives from either faction at a meeting with the plant management or at appeal meetings, such individuals must be designated by name in writing by the chairman of the shop committee at least 24 hours before the proposed meeting.

"General Motors desires to avoid charges of taking sides in this union controversy and it is our opinion that

meetings with any international representatives without the members of the shop committee being present, would be misunderstood. This position was explained on Jan. 26 to Ed Hall and Elmer Dowell, representatives of the two factions of the UAW."

Developments in the bitter factional struggle between officers of the union continue to follow thick and fast with both sides currently conducting spirited campaigns for support, both financial and voting, of the union's many locals in anticipation of the rival conventions called for March 5 in Detroit by the Homer Martin faction and March 27 in Cleveland by the anti-Martin faction.

Plymouth Announces New Panel Delivery

Plymouth has announced a new Panel Delivery mounted on the 1939 "Roadking" chassis with the 114-in. wheelbase of Plymouth passenger cars. The special panel body has a loading space of more than 124 cu. ft.

Government Purchases

Government awards for transportation equipment under the Walsh-Healey Act during the week ended Jan. 28 aggregated \$271,744.53. Details of the awards are as follows:

United Aircraft Corp., Pratt &

Whitney Aircraft division, \$46,709.05 for aircraft engine parts; Bendix Aviation Corp., Eclipse Aviation division, \$12,075 for regulator assembly; Curtiss-Wright Corp., Curtiss Propeller division, \$25,200 for aircraft propellers and \$27,865.68 for hub and booster assemblies; The Leece-Neville Co., \$11,400 for generator assemblies; The United States Gage Co., \$12,560 for indicator assemblies; General Motors Corp., Chevrolet division, \$33,576.54 for automobiles and \$55,371.66 for trucks; Yellow Truck & Coach Mfg. Co., General Motors Truck and Coach division, \$20,986.60 for trucks; Ingersoll Rand Co., \$26,000 for trucks.

GM Distributes Cash Savings to Employees

General Motors Corp. this week began the distribution of \$1,317,787 in common stock and cash to thousands of employees throughout the country, under provisions of the Employees' Savings and Investment Plan. Of the total to be distributed, the corporation contributed \$591,847, and \$725,940 was paid in by employees.

More than \$249,300,000 has been distributed to General Motors employees since the inception of this plan of systematic savings 20 years ago. Of this total, more than \$105,900,000 represents the corporation's contribution, and approximately \$143,400,000 the amount paid in by employees.

The current distribution is being made to the Class of 1933, representing those employees who in the last five months of that year participated in the Plan. Payments were made only for this period during 1933. Each participant who paid \$100 into the Fund now receives a cash settlement of approximately \$131 and one share of General Motors common stock. On other amounts paid in, returns are in proportion, cash being paid for fractional shares.

Parker Rust Proof Co. Earned \$575,737 in '38

Net earnings of the Parker Rust Proof Co., as reported in the company's annual report to its stockholders, amounted to \$575,737.75 for the year 1938. This was stated to be 51 per cent below the earnings reported for 1937 and marked the first time since 1932 that the company has not been able to report an increase in net earnings.

1938 Canadian Car Sales Totaled 121,411 Units

In the final month of 1938 sales of new motor vehicles in Canada gained 1.9 per cent in number and 4.8 per cent in value over December, 1937. The number was 8453 retailing for \$9,475,257, compared with 8292, for \$9,043,174 a year ago. In the previous month the number was 8646 and the value \$9,725,-

496. Sales of new motor vehicles in Canada during 1938 totaled 121,411 units, retailing for a total of \$135,281,581, against 144,441 for \$149,170,527 in 1937.

The following table shows the retail value of sales by months, and comparisons with a year ago.

	1938	1937	% Chge.
January	7,686,130	8,846,034	-13.1
February	7,875,152	9,234,073	-14.7
March	13,504,044	16,723,345	-19.3
April	23,070,476	21,112,715	+ 9.3
May	19,991,349	21,453,442	- 6.8
June	12,992,722	18,244,997	-28.8
July	9,215,074	12,810,854	-28.1
August	8,018,020	9,521,833	-15.8
September	6,566,378	6,638,629	- 1.1
October	7,161,483	6,552,261	+ 9.3
November	9,725,496	8,989,170	+ 8.2
December	9,475,257	9,043,174	+ 4.9
12 months	135,281,581	149,170,527	- 9.3

Facilities of Two Trailer Companies Bought by Elcar

Elcar Coach Co., Elkhart, Ind., has announced the purchase of the building and assets of the Lee Trailer company and the machinery and equipment of the Harris Caravan Coach company, both of Plymouth, Ind. H. A. Hill, chairman of the board of directors of the Elcar company, said that the business of both companies would be concentrated in the Lee plant and that Fred J. Hibbs, assistant manager in the Elcar plant, would go to Plymouth to be in charge of the plant there.

NADA Enlarges Its Legal Department

The National Automobile Dealers Association has announced the enlargement and reorganization of its legal and legislation department. The Detroit firm of Bulkley, Ledyard, Dickinson & Wright has been employed as general counsel for the N.A.D.A. Charles W. Bishop, of the firm, has been assigned to the association's work and will be in charge of the enlarged department.

The issuance of a weekly legislative bulletin to all interested persons is contemplated throughout the legislative season.

Boeing Considers A New TWA Suit

Boeing Aircraft Co. attorneys at Seattle are said to be considering filing of a new suit in New York or appealing from a dismissal by Federal Judge John C. Bowen of a \$1,620,000 suit against Transcontinental & Western Air, Inc. Boeing charged Transcontinental & Western refused to carry out a contract for purchase of six stratoliners. Judge Bowen dismissed the suit, ruling that Transcontinental & Western was solely a transportation concern not doing business in Seattle.

Automotive Industries

Effective Date for Minimum Steel Wages Set for March 1

Ourselves and Government—A Check List Of Federal Action Corrected to Feb. 2

DEPARTMENT OF LABOR

STEEL WAGE DECISION. The department has extended from Jan. 31 to March 1 the effective date of the order, which prescribes four minimum hourly wage rates ranging from 45 cents to 62½ cents. The postponement was ordered to permit the steel companies affected "to make necessary adjustments to comply with the decision." The Bethlehem Steel Corp. and a committee representing 29 small iron and steel producers in the East have requested a delay to permit additional time for studying the economic consequences of the decision.

FEDERAL TRADE COMMISSION

F.O.B. PRICE CASE. Hearings are due in the Ford case but no specific date has been set. It had previously been fixed for Jan. 25 but was cancelled. The Commission is expected to close its case after the hearings. Date for GM hearings in Detroit has been fixed for Feb. 21. The FTC alleges in the proceeding that price advertising was misleading.

SIX PER CENT CASE. The FTC brief in the GM case was filed late last week (see story on page 125). The

respondents now have an opportunity to reply, after which final arguments will be scheduled. Final argument in the Ford proceeding is due to be scheduled soon.

VS. UNITED STATES RUBBER CO. Respondents have asked for additional time to reply to the complaint and have been given until March 1. The FTC alleges unlawful price discrimination. (Turn to page 128, please)

World Bestos Elects Directors and Officers

At a recent meeting of World Bestos stockholders, new directors and officers were elected: C. P. Brockway, former vice-president, was elected president and general manager; William Nanfeldt was elected vice-president in charge of engineering and production.

Chicago to Get '39 Truck Show

The executive committee of the National Motor Truck Show, Inc., has announced that the Sixth Annual National Motor Truck and Accessory Show will be held at the Navy Pier in Chicago from Nov. 8 to 16, inclusive, 1939.

Suppressor

P. C. Sandretto (right), head of United Airlines' research laboratories, and Captain Don Brown examine a new United-Bendix static discharge mechanism. Sandretto is pointing to one of the two sockets in the tail of a Mainliner plane in which the devices are installed. When the pilot encounters a radio static condition he presses a button which electrically releases a wire in the slip-stream to trail behind the plane. Static electricity is discharged through a special suppressor.



Aeme

February 4, 1939

Pace of Industrial Activity Slows; Fisher Index at 79.8

*An Exclusive and Regular Weekly Feature
Written by the Guarantee Trust Co., N. Y.*

Indications of a somewhat slower pace of industrial activity last week were reported. The *Journal of Commerce* index of business for the preceding week, ended Jan. 21, advanced to 86.6 from 85.9 for the second week of the month, as compared with 71.2 a year ago.

Retail trade last week was reported as slow; activity in the wholesale branch maintained a level somewhat above that of a year ago, although pronounced caution in the building up of merchants' inventories was generally apparent. Department store sales in the third week of the month, according to the report of the Board of Governors of the Federal Reserve System, were at the same level as that reported a year earlier, although for the four-week period ended Jan. 21 sales fell 5 per cent below the comparable figure a year ago.

The production of electricity by the light and power industry in the week ended Jan. 21 advanced slightly above that in the preceding week, contrary to the usual seasonal trend, and exceeded by 8.6 per cent the corresponding 1938 output.

Railway freight loadings in the same period, 590,359 cars, registered a gain of 3482 cars over the preceding week's total, although a seasonal decrease in the third week of January is ordinarily expected, and were 3.5 per cent above the comparable 1938 loadings.

Average daily production of crude oil in the same week was 3,264,450 barrels, or 20,850 barrels more than in the second week of the month, and compares with 3,506,200 barrels for the third week of last year.

The average daily output of soft coal in the week ended Jan. 21 was 1,350,000 tons, slightly more than in the preceding week, and compares with an average of 1,200,000 a year ago.

Engineering construction awards in the week ended Jan. 26 amounted to \$49,483,000, according to the *Engineering News-Record*. The current figure, 2.5 per cent below the comparable 1938 awards, is the first in nine weeks to fall below the corresponding total a year earlier.

Lumber production in the week ended Jan. 21 was 3 per cent above that reported for the preceding week, and shipments showed a similar gain of 4 per cent; but new orders declined 3 per cent. Reported production was 33 per cent above the comparable 1938 figure; shipments registered a gain of 20 per cent, and new orders were 12 per cent greater than a year ago.

Professor Fisher's index of wholesale commodity prices remained unchanged last week at 79.8, one fractional point above last year's low point recorded in the week before Christmas.

Reserves of member banks of the Federal Reserve System increased \$35,654,000 in the week ended January 25. Estimated excess reserves rose \$40,000,000 to a new peak of \$3,600,000,000. Total bills discounted by the Federal Reserve banks stood at \$4,695,000, as against \$11,470,000 a year earlier, while industrial advances amounted to \$15,131,000, as compared with \$17,929,000 a year ago.

Shipments of Casings Off 6.1% in December

Shipments of pneumatic casings during the month of December, 1938, are estimated at 4,170,808 units, according to statistics released by the Rubber Manufacturers Association, Inc. Although a 6.1 per cent decrease under November shipments, the decline is less than the usual seasonal decline for the

month for both replacement shipments as well as shipments to automobile manufacturers and is 37 per cent over shipments for December, 1937. Shipments for the year were 20.7 per cent under 1937.

The association estimates production of pneumatic casings for November at 4,678,878 units an increase of more than 13 per cent over November and 64.1 per cent over December, 1937. Production for the year showed a decrease of 24.9 per cent under 1937.

Pneumatic casings in the hands of manufacturers Dec. 31 are estimated at 8,497,932 units, an increase of 7.3 per cent over stocks as of Nov. 30 and 18.2 per cent less than on Dec. 31, 1937. Owing to the higher sales during recent months stocks had reached a dangerously low point and the small increase in stocks at the close of the year is not sufficient to satisfy expected spring demands.

Men

Charles W. Nash, chairman of the board, Nash-Kelvinator Corp., Detroit, observed his seventy-fifth birthday anniversary on Jan. 28 at his winter home in Beverly Hills, Calif.

Charles W. Pendock, president and general manager of the Le Roi Co., Milwaukee, manufacturer of internal combustion engines, air compressors, etc., has been nominated without opposition for the presidency of the Milwaukee Association of Commerce. He has long been prominent in association affairs, more particularly in its widely recognized safety activities.

Harry M. Stratton, vice-president of the Briggs & Stratton Corp., Milwaukee, has been elected a director of the Marine National Exchange Bank of Milwaukee.

Herman W. Falk, president of the Falk Corp., Milwaukee, steel founder and gear manufacturer, has announced the appointment of Louis W. Falk as executive engineer, and W. P. Schmitter as chief engineer. Harold S. Falk remains as director of engineering.

The promotion of Lester A. Lanning, chief metallurgist, to assistant plant manager has been announced by New Departure Division, General Motors Corp., Bristol, Conn. Mr. Lanning was formerly superintendent of the New Departure Heat Treating Division. The promotion of John C. Kielman to superintendent of New Departure's Heat Treating division has also been announced. Mr. Kielman was formerly assistant superintendent of the division.

Edward Warner, professor of Aeronautical Engineering at the Massachusetts Institute of Technology and former president of the Society of Automotive Engineers, has been named as economic and technical adviser to the Civil Aeronautics Authority.



Smoothness

The "Profilometer" is now being used by Cadillac-LaSalle for an additional check on crankshaft bearing smoothness. The instrument consists of a tracer that houses a diamond tip. Motions of this tip as it moves over a surface are amplified and transformed to electric voltages. A meter averages surface irregularities to millionths of an inch.

Edward J. Noble, CAA chairman, who made the appointment, said that Mr. Warner has been assisting the Authority for some weeks on a consulting basis. His appointment is to be temporary, at his request, the CAA chairman said.

H. L. Edsall, secretary and director of public relations, G. S. Rogers & Co., recently announced his resignation from the board of directors.

L. M. Baltzell, member of the laboratory staff of the Wolverine-Empire Refining Co., Oil City, Pa., has been appointed a member of the Technical Advisory Committee of the Pennsylvania Grade Crude Oil Association.

Louis J. Galbreath has been appointed technical adviser of the New York district sales division of Revere Copper & Brass, Inc.

Henry H. Roberts has resigned as general and legislative counsel of the National Automobile Dealers Association.

Joseph F. Heil has been elected executive vice-president of the Heil Co., Milwaukee, Wis. The company also has announced that George W. Kuhlman, manager of the Heil eastern factory at Hillside, N. J., has been elected a vice-president.

Arthur J. Williamson has been added to the technical staff of Summerill Tubing Co., Bridgeport, Pa., as metallurgical engineer in charge of research and development.

C. W. Franz has been added to the sales staff of Acheson Colloids Corp., succeeding T. P. Hunt.

George R. Scott, president Cone Worm Gear Corp. and gear consultant, Michigan Tool Co., is to address the February meeting of the Association of Iron & Steel Engineers in Detroit on Feb. 14 on the subject of "The Evolution of Worm Gearing, Culminating in the Cone Design." The paper is to include developments from engineering, manufacturing and application standpoints recently.

Fred E. Bishop, recently appointed general sales manager at Graham, will inaugurate a national sales contest with a personal appearance before every Graham dealer in the country during a series of field meetings in the immediate future.

Robert R. McMath, formerly president of the Motors Metal Mfg. Co., Detroit, has been elected chairman of the board of directors. Steven J. Menzel, formerly vice-president, has been named president; Nelson C. Johnson, formerly secretary and treasurer, vice-president and secretary; and Harold G. Shaw, treasurer.

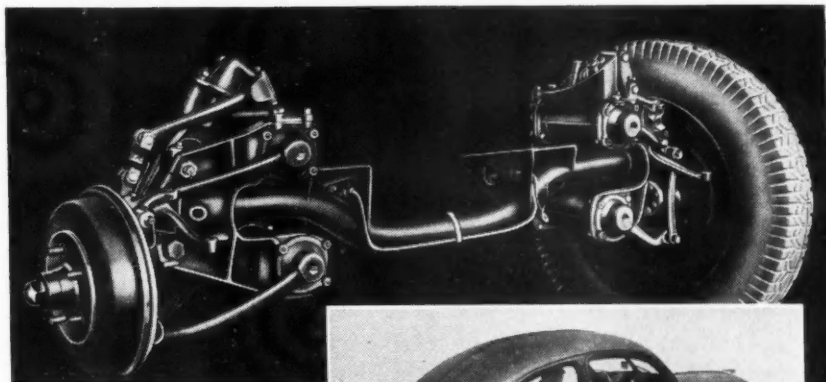
Directors of the company, in addition to the first three officers, include Neil C. McMath, Willard S. Pope, Harry A. Burnett, and Chas. T. Miller.

The German Hanomag Co. Will Confine Output to One Model

Independent Front Springing on Rubber Is the Outstanding Feature of New Car

In conformity with the general tendency in the German automobile industry to reduce the number of models in production (to allow for the expected shrinkage of the market for indepen-

tending forward from the body. Above and below the tubular drop axle on each side are two fixed steel cylinders with longitudinal axes. A tube of soft rubber is vulcanized into each of these



Hanomag Car

One feature of the new Hanomag five-passenger sedan (shown at the right) is the system of independent front springing on rubber. A view of the tubular drop front axle with rubber suspension members appears above.



dent makes when the Volkswagen gets into production), the Hanomag Company of Hannover has discarded all of its former models and will confine its efforts in the future to a single new model embodying a number of advanced features of design. This new car has a five-passenger sedan body of the self-carrying type, of all-steel construction, electrically welded. The body, which was developed with the aid of wind-tunnel tests, is thoroughly streamlined.

The engine is a four-cylinder, valve-in-head type of 2.79-in. bore by 3.39-in. stroke (nearly 80 cu. in.), and with a compression ratio of 6 it develops 32 hp. at 3600 r.p.m. The new model, referred to as a 1.3-liter, has a more spacious body than a previous 1.5-liter model, yet it weighs only 2135 lb. as compared with 2310 lb., and the excellent streamlining is said to give it a maximum speed of 71.5 m.p.h.

On outstanding feature of the new car is its system of independent front springing on rubber, which has been developed in collaboration with the Continental Rubber Co., also of Hannover. The two front wheels, together with a tubular front axle, the springs, and the steering gear, form a separate unit which is firmly bolted to arms ex-

cylinders, and inside the rubber tube is another steel tube which is splined on the inside and has a splined bolt passing through it. To the projecting ends of the two bolts are secured "wish-bones" that support the steering head. While the rubber suspension members have considerable damping capacity, additional hydraulic damping is provided, hydraulic shock absorbers being located over the upper spring cylinders and jointed to the brake backing plates by links.

The rear axle is of the conventional spiral bevel-drive type, with semi-elliptic springs and hydraulic shock absorbers.

A feature of the engine is that it has wet cylinder liners. Valve-seat inserts are used for the exhaust. A "four-point" belt drive is used for the fan, the water pump, and the 90-watt generator. Camshaft drive is by helical non-metallic gear. Equipment includes a Solex cross-draft carburetor, a 12-volt battery ignition system, a wick-type oil filter, a mechanical fuel pump, and a Bosch starter with over-running clutch.

The single-plate clutch has a graphite disc throw-out bearing. The transmission is a four-speed type with the gears of the two higher speeds remaining in mesh continuously. Gear ratios are 4.55, 2.33, 1.48 and 1, and the rear axle ratio is 4.57, but for mountainous districts an axle with a 5.17 ratio is offered.

Ford Files Motion With NLRB Demanding End to Proceedings

Company Move Follows Issuance Of New Order by Labor Board

Continuing its contest with the National Labor Relations Board the Ford Motor Co. filed a motion on Jan. 28, in Washington, demanding that the board drop all proceedings against the company on the grounds that the hearings conducted in Detroit in July, 1937, by John T. Lindsay, trial examiner, were a travesty on judicial procedure because of prejudice, error and bias.

The motion followed issuance of a new order on Jan. 27 by the NLRB ordering the company to "stop discouraging membership in the United Automobile Workers Union" and to reinstate with back pay 29 employees allegedly dis-

charged for union activities. The new order also directed the company to cease organizing or supporting vigilante or similar groups and that members of the company service department cease attempting to prevent employees from joining the UAW.

This new order took the place of one previously withdrawn by the NLRB for amendment after a Federal court had handed down a decision questioning the procedure in another case which procedure paralleled that used in the Ford case. Withdrawal of the original order had been sustained by the U. S. Supreme Court after being fought by the

Airplanes in a Hurry

If the time ever comes when the United States has to produce thousands of airplanes in a hurry, the United States will produce thousands of airplanes in a hurry.

This assurance comes from William S. Knudsen, president of General Motors Corp., who is on the Pacific Coast with other officials of the company for a business check-up.

Says Mr. Knudsen, "The aviation industry is in the period of development; it hasn't had any use for real production. But—if we have to, we can make them as fast as any one can make them."

company. In filing its latest motion the company also charged that withdrawal of the original order implied that the NLRB was to reconsider its entire case instead of merely issuing an amended order, and requested that evidence be suppressed so that the entire case could be reconsidered.

The motion names 200 instances of "antagonistic, partisan and hostile" acts by the trial examiner during the original hearing and says that these are only a relatively few of the innumerable instances of non-judicial attitude displayed by the examiner during the hearings. All of the instances charge partisanship toward UAW and CIO witnesses and counsel and an opposite attitude toward company witnesses and counsel.

Passenger Car Exports Advanced Again in December

Exports of passenger cars and chassis from the U. S. ended the year, 1938, about 25 per cent below the 1937 mark. In December alone exports were slightly more than 25 per cent below the same month in 1937. Automotive exports have, however, shown a steady increase since August with December shipments of passenger cars numbering 21,203 units as compared with 20,079 units in November. Trucks advanced from 8856 units in November to 13,630 units the next month.

According to I. H. Taylor, chief, automotive-aeronautics trade division, Department of Commerce, the continued strength of purchases in the foreign field is evidenced by the total valuation of \$74,645,344 recorded in the final quarter of the year, or 59 per cent above the third quarter total of \$46,858,645.

	DECEMBER 1938		DECEMBER 1937		TWELVE MONTHS ENDED DECEMBER			
					1938		1937	
	No.	Value	No.	Value	No.	Value	No.	Value
EXPORTS								
Automobiles, parts and accessories		\$ 29,160,926		\$ 39,710,176		\$ 270,388,947		\$ 346,848,333
PASSENGER CARS								
Passenger cars and chassis	21,203	12,992,526	27,463	16,273,400	161,612	100,143,211	229,486	134,814,725
Low price range \$850 inclusive	18,461	10,091,018	24,624	13,243,290	141,281	78,326,152	208,391	111,858,381
Medium price range over \$850 to \$1,200	2,383	2,250,692	2,403	2,289,741	17,377	16,750,084	17,754	16,789,385
\$1,200 to \$2,000	281	422,310	346	513,432	2,356	3,500,441	2,403	3,652,738
Over \$2,000	78	228,506	90	226,937	598	1,566,534	938	2,514,221
COMMERCIAL VEHICLES								
Motor trucks, buses and chassis (total)	13,630	7,088,748	22,734	13,334,525	115,595	72,116,930	165,710	100,105,472
Under one ton	2,301	890,755	2,775	1,078,786	17,152	7,144,931	20,691	8,322,918
One and up to 1½ tons	10,202	4,660,619	16,509	8,469,602	79,908	42,874,996	109,457	54,421,741
Over 1½ tons to 2½ tons	776	687,729	1,915	1,496,470	11,563	9,416,051	24,820	19,578,188
Over 2½ tons	313	815,795	1,330	2,120,539	5,735	11,498,237	9,230	16,550,122
Bus chassis	38	33,850	205	169,128	1,237	1,182,715	1,512	1,232,503
PARTS, ETC.								
Parts except engines and tires								
Automobile unit assemblies		4,604,933		5,036,217		46,438,562		53,421,722
Automobile parts for replacement (n.e.s.)		3,186,634		3,273,526		36,745,210		38,276,643
Other automobile accessories (n.e.s.)		367,154		379,846		3,843,757		4,861,778
Automobile service appliances		440,781		517,473		5,700,993		6,496,088
Airplanes, seaplanes and other aircraft	102	2,966,451	57	1,406,100	876	37,977,924	629	21,036,361
Parts of airplanes, except engines and tires		1,875,124		1,960,107		21,930,343		12,157,4337
INTERNAL COMBUSTION ENGINES								
Stationary and Portable								
Diesel and semi-Diesel	38	136,442	58	130,683	523	2,125,313	857	2,281,660
Other stationary and portable								
Not over 10 hp.	1,485	80,843	1,730	111,821	16,285	881,808	20,773	1,167,487
Over 10 hp.	149	185,892	109	85,868	3,242	1,581,830	3,238	1,616,795
Engines for:								
Motor trucks and buses	2,271	249,653	4,310	445,819	24,871	2,752,984	32,912	3,290,396
Passenger cars	2,907	235,547	7,229	505,174	38,772	3,159,289	82,578	5,563,751
Aircraft	126	832,748	79	510,616	1,307	7,899,844	1,047	5,944,004
Accessories and parts (carburetors)		294,430		219,822		2,828,908		2,753,525
IMPORTS								
Automobiles (durable)	40	24,132	106	52,249	580	374,862	1,949	1,158,424

Abstracts

Blast Riveting

When it is attempted to rivet parts to box-section structural members, difficulties are encountered by reason of the fact that the rivets are accessible only from the outside, and cannot be headed in the usual way. For such cases a new form of riveting known as "blast riveting" has been developed. The rivet is headed by igniting a charge of explosive which is packed tightly in a bore in the shank, in which it is held firmly and protected against atmospheric influences by a coating of lacquer. Diameter, length, and location of the bore are so chosen that the pressure produced by the detonation forms a head on the rivet which grips the parts united firmly. The explosive charge is so compounded that it ignites when heated to 265 deg. Fahr. An electric rivet heater with a conical point of silver or aluminum is applied to the outside head of the rivet, and the explosive charge reaches its ignition temperature in a matter of 2 to 3 seconds.

In order to insure a good riveted joint it is necessary that the bore of the shank be accurately concentric. The quality of the work also depends on

the quantity and quality of the explosive and the length of the shank with respect to the thickness of the sheets to be united. Required lengths for different thicknesses have been tabulated. The rivets are made of aluminum alloy and anodized. Anodizing is said to prevent intercrystalline corrosion in the rivet while at high temperature, and also to impede heat flow to the sheets.—*VDI Zeitschrift*, Dec. 24.

CAA Designs "Pilot Reaction" Equipment

New laboratory equipment to test individual pilot reaction under varying degrees of oxygen starvation at high altitudes has been designed by staff technicians of the Civil Aeronautics Authority and will be tested within the next two months at the Authority's Medical Science Center in Kansas City.

Studebaker "Revamp"

Studebaker's Pacific Coast plant at Los Angeles will close for two weeks beginning Feb. 20, it is reported, in order to rebuild the chassis assembly lines to greater length. The change is expected to increase the plant capacity by 50 per cent. Production will be resumed about March 5. This Pacific Coast plant was opened in November 1935.

Independent Air Filter To Discontinue Business

The Independent Air Filter Co., Chicago, has decided to discontinue its business. The affairs of the company are now in liquidation and the process will be completed as rapidly as possible. Arrangements have been made to complete all outstanding orders and continue indefinitely all required service to customers having Independent equipment.

Sears to Introduce New "Squeegee" Tire

Sears Roebuck & Co., leading mail-order house marketing private brand tires, soon will introduce a new type of squeegee tread pneumatic tire in direct competition with similar type treaded tires being featured by the major independent tire manufacturers. Rush orders for molds for the new tire are understood to have been placed with many mold manufacturers, including at least four in the Akron area. The new tire, it is reliably reported, will have a tread design not dissimilar to non-skid tread designs of the major tire manufacturers, but with superior squeegee and non-skid effect.

AUTOMOTIVE INDUSTRIES

*Summary of Automotive Production Activity
(Week Ending Feb. 4)*

BUSES One large producer this week announced the reception of several sizeable orders. Some important inquiries for replacement units and factory additions for expanded operations have cheered distributors. Actual deliveries reported running a little under early 1938.

TRUCKS With little change in rate of orders from large and small users for new equipment, strongest activity this week appears to be in inquiries and orders for replacement equipment.

TRACTORS Virtually all principal producers report they are stepping up production for spring business. Many dealers are holding demonstrations and clinics for explanation of equipment usage and discussion of farmers' equipment problems.

AUTOMOBILES Production estimated at 80,000 cars and trucks for week ending Feb. 4. January output placed at approximately 370,000 units. Slight curtailment noted as adverse weather hinders deliveries. Registrations reported up in some sections of the country, down in others, with general trend downward. Used car sales reported generally good.

MARINE ENGINES Leading companies report a rise in output with most makers busy building up parts and sub-assembly inventories in expectation of rush in orders in spring.

AIRCRAFT ENGINES Exports of engines for 1938 reported 24.8 per cent over 1937. All factories busy with no signs of slump. Experimental work for government equipment continues without letup.

This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.

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Recommends Order Against GM in "Six Per Cent" Case

FTC Attorney Claims That Corporation Started Plan and Other Firms Were Forced to Follow

A Federal Trade Commission trial attorney recommended last week that the FTC issue a cease and desist order against the General Motors Corp., under which the company would be prohibited from advertising the so-called "6 per cent plan" of financing automobile sales.

James M. Hammond, FTC trial attorney, wrote in his brief filed with the Commission that General Motors Corp. has made large profits derived from "the false and deceptive practices disclosed by the evidence in this case," and charged that the firm invented "the pernicious '6 per cent plan' and gained such a competitive advantage thereby that it dominated the entire industry, necessitating the publication of similar plans by its competitors."

After reviewing a good deal of the testimony received from purchasers in the proceeding in fortification of his contention that automobile consumers are misled by such advertisements, Hammond said he recognized that, although the respondents are still using the financing plan, they no longer publicly advertise the plan. He took the position, however, that termination of the advertisements is no bar to these proceedings.

Under the "6 per cent plan," the FTC contends, a purchaser pays "approximately 11½ per cent interest"

when computed as simple interest, and that for a "transaction involving an unpaid balance of \$600, amortized over a period of 24 months, the purchaser would pay for the 24th month 14 per cent interest." The FTC also has protested that the purchase agreement allegedly fails to set forth the amount charged purchasers under the plan.

40 Years Ago

Among the improvements that are being put on the new Winton carriages may be mentioned an automatic oiler, oiling all bearings, and iron composition, instead of bronze, boxes. Instead of working on an arm, as in the earlier vehicles, the counterbalance now works in a direct line, obviating up and down vibration. The gasoline feed has been simplified, and is coupled direct to the valve stem. All the machinery is more accessible, and a more convenient mode of adjustment has been adopted. Phosphor bronze gears are used, and a new tubular water tank greatly assists radiation, rendering a small supply of water sufficient.

Of the twenty-five carriages this company is now putting through, all have been sold.—From *The Horseless Age*, February, 1899.

Goodrich's California Plant Hit by Walkout

Workers Quit When Company Announces Intention to Resume Eight-Hour Day

With contract negotiations between the B. F. Goodrich Co. management in Akron and the Goodrich local of the United Rubber Workers Union of the CIO, apparently stalemated on the issues of paid vacations and flexibility of hours, and with T. G. Graham, vice-president of Goodrich, issuing public notices urging a greater flexibility of work schedules and pointing to the advantages of the eight-hour day, the California Goodrich factories at Los Angeles, Jan. 31, were shut down as 550 URWA employees struck in protest against the company's announced intention of putting the eight-hour day into immediate effect.

After the California Goodrich management had posted a bulletin that the company would replace the six-hour day with eight-hour day schedules, Feb. 1, the union members by a 95 per cent majority voted to demand a retention of the six-hour day. The walkout immediately followed.

Unless the Goodrich California strike is quickly settled it may spread to other Goodrich factories in the United States, including the parent plants at Akron, mechanical goods plants at Cadillac, Mich., and original equipment tire factories at Oaks, Pa. George B. Roberts, district director of the URWA in California declared that 100 per cent support by other URWA locals of Goodrich had been pledged. He declared that the strike was necessary "to get bargaining rights guaranteed by law."

In a statement issued by the Goodrich management on the West Coast it was said that the increased hours were due to better business conditions, increasing production at the plant from 50 to 70 per cent and that there would be no reduction in pay or loss of jobs through adoption of the eight-hour day.

Penna. Finance Association Names Officers & Directors

The Pennsylvania Finance Association held its annual meeting at the Hotel Sylvania, Philadelphia, Jan. 27, resulting in the following officers and directors being elected for the current year:

President, G. A. Piviroto, president of the Automobile Finance Co., Pittsburgh; vice-president, Walter C. Atkinson, president Commercial Banking Corp., Philadelphia; secretary-treasurer, L. M. Seiver, president Automobile Banking Corp., Philadelphia.

Directors: Ray W. Norton, Philadelphia Manager Commercial Investment Trust, Inc., Philadelphia; F. R. Wills, president General Acceptance Corp., Bethlehem; Ralph J. Clauss,

president Penn Securities Co., Allentown; William R. Tucker, Jr., The Pennsylvania Co. for Insurance on Lives and Granting of Annuities, Philadelphia. Mr. Tucker is the retiring president of the association.

W. P. Berrien was unanimously appointed by the new board executive secretary for the association.

Chrysler Offers New Club Coupe

Chrysler has recently gone into production on a new body style—a club coupe for five passengers. The car comes in three styles, the Royal Windsor, New Yorker and Saratoga. On the Royal chassis, it has a six-cylinder engine developing 100 hp., and a wheelbase of 119 in. The Saratoga and New Yorker versions of the coupe are built on a chassis of 125 in. and the eight-cylinder engine develops 135 hp.

Mexican Motor-Vehicle Imports Slumped in '38

Mexican motor-vehicle imports, including motorcycles, were valued at \$4,345,242 for the first nine months of 1938, as compared to \$13,743,285 dur-

ing the corresponding period of 1937, reports to the Commerce Department indicate. The United States, as the leading supplier during the period covered, accounted for \$4,119,804 of the imports, or 95 per cent, as compared with \$13,391,252, or 99 per cent in the first nine months of 1937. Germany, was the second supplier, furnishing 4.7 per cent of the motor vehicle imports in 1938 and 2 per cent in 1937.

1938 Tractor Production Valued at \$150,354,719

Bureau of the Census figures covering incomplete returns from manufacturers of farm equipment and related products show that 1938 production of tractors amounted to 187,487 units valued at \$150,354,719, a decrease of 34 per cent under the value of tractors produced in 1937.

Steel Sales

(Continued from page 119)

cred to 52.8 per cent, a gain of approximately 3 per cent over the preceding week.

Non-ferrous metal markets marked time at the opening of the business week pending Herr Hitler's pronouncements and the interpretation put upon them by the financial community. When the latter turned out to be cheerful, and tin prices advanced 4 Pounds Sterling in London, the market here fell in line and tacked around \$10 a ton to the New York price, which on Tuesday



Control Tube

A new magnetically controlled industrial tube is inspected by W. P. Overbeck, P. L. Spencer, the inventor, and J. W. Dawson (shown left to right). The new Permatron and other industrial tubes, now under power test in the laboratories of The Raytheon Production Corp., Newton, Mass., are being applied to such applications as the accurate regulation of generator voltage and the control of current supply to welding guns in automotive plants.

closed at 46.45 cents for spot Straits, compared with 45.95 cents on Monday. Copper prices also firmed. On Monday spot electrolytic was available in the outside market at 10½ cents, but on Tuesday 10½ cents became an inside price and the scrap price was lifted ½ cent to 8¼ cents. The export price rose from 10.15 to 10.30 cents. Mine producers and custom smelters retained 11¼ cents as their quotation for electrolytic. Speculation as to the ultimate fate of the British-owned Rio Tinto copper mines in Spain increased. Lead ruled stronger, not so much because of a mild advance in London, but because of continuing improvement in the buying of storage battery manufacturers.—W. C. H.

Display Fleet

One of a fleet of three mobile display units placed in service by the Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh.



AFL "Design for Living" Submitted to the Senate

Proposed Amendments to Wagner Act Said To Be "Healthy Sign" in Labor Picture

The AFL's design for living under an improved labor law was submitted to the Senate last week in the form of proposed amendments to the National Labor Relations Act introduced by Senator David I. Walsh, Democrat of Massachusetts. Although the proposed revision of the Wagner Act would not relieve business to the extent suggested in industry-sponsored amendments, one of the changes embodied in the bill would permit the labor board to investigate petitions for collective bargaining elections filed by an employer and to order the election.

As described by Green, the Walsh bill proposes: "(1) to make it obligatory on the board to respect the right of craft groups to decide for themselves by majority vote who their bargaining representative shall be; (2) to curtail the assumed power of the board to invalidate legal contracts between employers and labor organizations, and (3) to correct the board's procedure so that all parties affected by any case will be given due notice, accorded a fair hearing, protected against abuses of discretion and assured of adequate judicial review of wrongful decrees."

The Walsh amendments followed by little more than a week the House measure drafted by Congressman Andrews, Democrat of Missouri, which was designed to extract from the NLRB its powers of both "judge and jury" by restricting the board's power to recommendations, with the United States Circuit Court deciding each case. Unlike the Anderson measure, the AFL bill is expected to gain wide acceptance in Congress. Hearings are virtually assured and many Congressional members already have expressed approval of the measure. But the biggest unknown factor involved is the Administration's attitude toward the bill.

Despite President Roosevelt's remarks in his annual message that ways must be found to end labor disputes and that several New Deal reform measures "still need some machining down," it is doubted that the White House will throw its support behind

the measure. To do so would run the risk of alienating John L. Lewis' CIO, which has vigorously expressed itself as opposed to any change in the Wagner Act. Rather, the Administration can be expected to adhere to the theory expounded many times at White House press conferences that changes to the law are inevitable over a period of time and are evolutionary in character. Administration lieutenants have frequently expressed the view that changes in the law are being made constantly by judicial interpretation and that any substantial revision should be held in abeyance pending further court decisions.

Introduction of the AFL measure was recognized as a healthy sign in the unsettled labor relations picture, but it served to emphasize the fact that an apparent inability to reconcile all forces moving in the direction of Wagner Act revision continues to hamper moves aimed at securing passage of any substantial changes in the law.

NASF Moves Headquarters

The National Association of Sales Finance Companies has moved its headquarters to 203 N. Wabash Ave., corner of Lake Street, Suite No. 2106.

Correction

We are informed by the Aluminum Co. of America that the statement made in our issue of December 24, 1938, in an abstract from the *Journal du Four Electrique*, that the Norwegian and Swiss aluminum plants which furnish most of the aluminum imported into this country, are controlled by the sole producer in the United States, is not correct, as the Aluminum Co. of America does not control or have an interest in any plants in either Switzerland or Norway.

Publications

Tag dial-indicating thermometers are described in catalog No. 1170 issued by the C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.*

"Orderly Traffic—The Automotive Safety Objective" is the title of a booklet prepared by the Automotive Safety Foundation, New York.

Electrical control apparatus, rheostats, and resistors are described in a catalog brought out by Schaefer Bros. Co., Chicago.*

The purpose and program of the Kelvinator National Salesmen's Institute are explained in a booklet issued by the Kelvinator division of Nash-Kelvinator Corp.*

The Louis Allis Co., Milwaukee, Wis., has prepared a new motor application chart which lists 26 different types of motors and checks the proper type recommended for about 50 standard applications.*

An engineering data book has been published by Link-Belt Co., Chicago, on its Silverstreak silent chain and Silverlink roller chain drives for automotive and stationary engines (timing and accessory driving).*

Bulletin No. 383 issued by Tech Laboratories, Jersey City, N. J., describes a new electronic viscosity meter.*

The W & K method of rolled-steel construction is explained in a pamphlet recently issued by the Whitehead & Kales Co., Detroit.*

A new bulletin giving performance ratings against pressure as recorded under the NAFM code for Torrington standard model Aristocrat quiet propeller fan blades is being offered by the Torrington Mfg. Co., Torrington, Conn.*

Two bulletins issued by the Chambersburg Engineering Co., Chambersburg, Pa., are: No. 255-A, "Model 'E' Steam Drop Hammer," and No. 275-A, "Cecostamp."*

Maremont Automotive Products, Inc., Chicago, has prepared a catalog covering a complete range of helper spring types.*

The Hydraulic Coupling division of American Blower Corp., Detroit, has issued a pamphlet on the traction type of hydraulic coupling.*

The Anaconda Wire & Cable Co., New York, has prepared a pamphlet describing "Sunex Securityflex" a sun and heat resisting, moisture, alkali and acid resisting covering for electrical cables.*

The Hanna Engineering Works, Chicago, has issued catalog No. 228 containing complete specifications and details of the Hanna cushioned and non-cushioned cylinders.*

*Obtainable from editorial department, AUTOMOTIVE INDUSTRIES, Address Chestnut and 56th Sts., Philadelphia.

Advertising

United States Rubber Co. returns to the CBS network of 82 stations Wednesday evenings from 10 to 10.30, beginning Feb. 22. Raymond Paige's 99-piece orchestra and voices will be the feature.

A. W. Spense, Jr., formerly with the advertising department of the International Nickel Co., has joined the copy department of Lord & Thomas.

General Motors Corp. dropped from first to fourth place among advertisers who spent more than \$1,000,000 in magazines, farm papers, and the radio last year. The car maker's total was \$4,735,329, according to a compilation made by *Printer's Ink* magazine, led by Procter & Gamble, General Foods, and American Tobacco Co.

William Jenkins Advertising, Philadelphia, has resigned the National Vulcanized Fibre Co., Wilmington, Del., account.

Storrs J. Case, formerly director of advertising, Graham-Paige Motors Corp., has joined Associated Sales Co., Detroit, producer of films for advertising purposes.

Sun Oil Co. has renewed the Lowell Thomas daily news program over the NBC coast-to-coast network. Roche, Williams & Cunyngnam is the agency.

Standard Oil Co., N. J., has renewed its "Esso Reporter" reporter program over the NBC Blue network.

Increasingly aggressive is Hudson Motor Car's safety theme in its current advertising. "Wink an eye . . . and you've gone 40 feet" is a headline warning drivers of the necessity for having good brakes. Brooke, Smith & French handle the account.

Calendar

Conventions and Meetings

SAE National Aeronautic Meeting, Washington	March 16-17
American Foundrymen's Association, Forty-third Annual Convention, Cincinnati	May 15-18
SAE World Automotive Engineering Congress	May 22-June 8

Shows at Home and Abroad

Berlin, Germany, Automobile Show,	Feb. 17-March 5
Sixteenth International Automobile Exhibition, Geneva, Switzerland,	March 3-12
A.S.T.E. Machine and Tool Progress Exhibition, Convention Hall, Detroit	March 14-18
Yugoslavia, Belgrade, Automobile Salon	April 1-8
Great Britain, London, Automobile Show	Oct. 12-21
Great Britain, London, Commercial Automobile Transportation Show,	Nov. 2-11
Great Britain, Glasgow, Scotch Automobile Show	Nov. 10-18
Italy, Milan, Automobile Salon,	Oct. 25 to Nov. 11

Curtiss Gets Huge Order from France

The Curtiss Aeroplane division of Curtiss-Wright Corp., Buffalo, N. Y., has received an order from the French government for 100 additional planes of the Hawk 75-A type. The pursuit ship order involves about \$4,000,000.

Curtiss is now busy building 100 Hawks for the French government to be delivered in April. Employment at the Buffalo plant is at an all-time peak of 4800, even greater than during the War. Three shifts are working.

Government

(Continued from page 121)

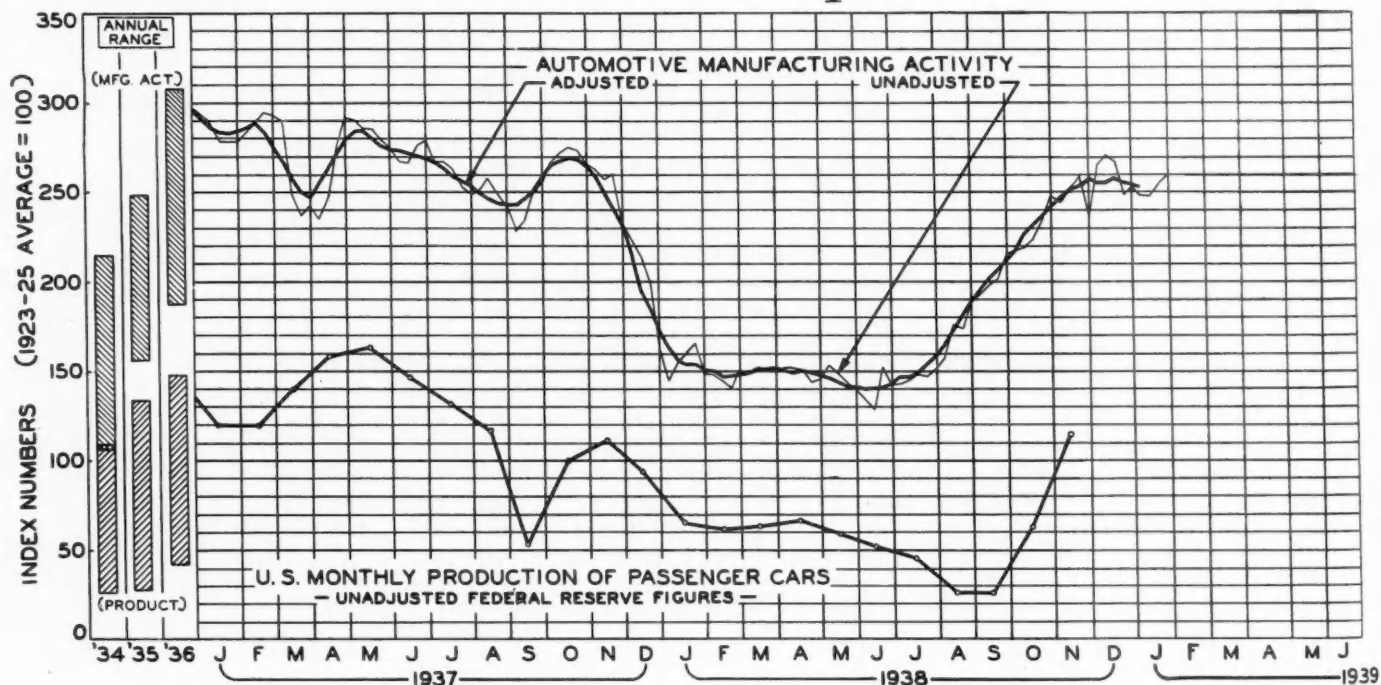
crimination in the sale of tires in violation of the Robinson-Patman Act. Also involved is the United States Tire Dealers Corp. of New York, a subsidiary.

VS. GENERAL MOTORS. No new developments since report in AUTOMOTIVE INDUSTRIES issue of Jan. 21.

NATIONAL LABOR RELATIONS BOARD

NLRB has certified the CIO's Federation of Flat Glass Workers as the sole collective bargaining group for about 3600 employees in seven plants of the Libbey-Owens-Ford Glass Co., Toledo, Ohio.

Automotive Index Continues Upward to Reach 260



The unadjusted index of automotive manufacturing activity for the week ending Jan. 28 continued upward to reach the 260 mark, six points above the mark set the previous week.

The adjusted index curve turned more sharply downward to 252, the posting for the week ended Jan. 7. This was three points below the mark registered in the preceding week.

Just Among Ourselves

A New Specter Bobs Up

THE relation between causes and effects in the automobile world is becoming more and more complicated. Just the other day at a meeting of finance company executives in Philadelphia, Mr. Coons, the able president of The American Finance Conference, suggested that if the participation of commercial banks in the automobile financing business goes much farther, the financing charges on older models of used cars and on new cars financed wholesale, would inevitably rise. Unless the older used cars can be financed at rates which permit them to flow back to purchasers, the used car inventory of dealers may reach a more or less permanent condition of stagnation which will have its effect on new car sales.

Granting that finance company executives may be inclined to view banker competition with more alarm than the rest of us might feel, there is considerable logic in Mr. Coon's position; certainly enough to justify going a little farther into the sequence of events which concern him.

Almost always the commercial bank, when it enters the automobile financing picture, is interested only in the retail financing of individual transactions. It will not handle wholesale floor planning for the dealer and it will not finance used car purchases. So, as Mr. Coons points out, the banks are taking the cream from the retail end of the finance company business. The remaining business naturally entails a higher loss ratio and these ratios are getting worse.

Somewhat Out Of Balance

IT is an open secret that finance companies take a car dealer's wholesale financing at small margin to get a look in on his retail business, which is profitable. But with the banks getting a high proportion of the retail business in some communities the income-expense ratios of finance companies are being disturbed seriously.

In Chicago, according to Mr. Coons, finance companies must write \$2 to \$2.50 of wholesale

financing for each dollar of retail business. In Chicago also, one bank has currently 14,000 automobile accounts on its books. Another Chicago bank operates such accounts with a loss ratio of 11/100 per cent.

There is not available any authoritative estimate of how much automobile financing is being done directly by commercial banks. Mr. Coons cited the 1937 annual report of The National City Bank as authority for the statement that the bank made 287,000 automobile loans in the year named. The Bank of America at the opposite end of the country wrote a hundred million dollars worth of retail financing paper in 1937 and increased this amount 25 per cent in 1938. The 1938 figure, according to Mr. Coons, includes 45 million dollars worth of automobile paper and represents the retail financing of 30 per cent of all the new cars sold in California, where the Bank of America's operations are concentrated.

Having established the fact that bank competition for finance companies is real and sizable, Mr. Coons cited three reasons for its growth. The finance companies, he admitted frankly, probably made too much money during the good years on money lent them by the banks.

What Effect Will It Have?

HE pointed out also that the finance company's treatment of customers has not been exactly ideal, and advocated a broad platform for the improvement of finance company standing with the public.

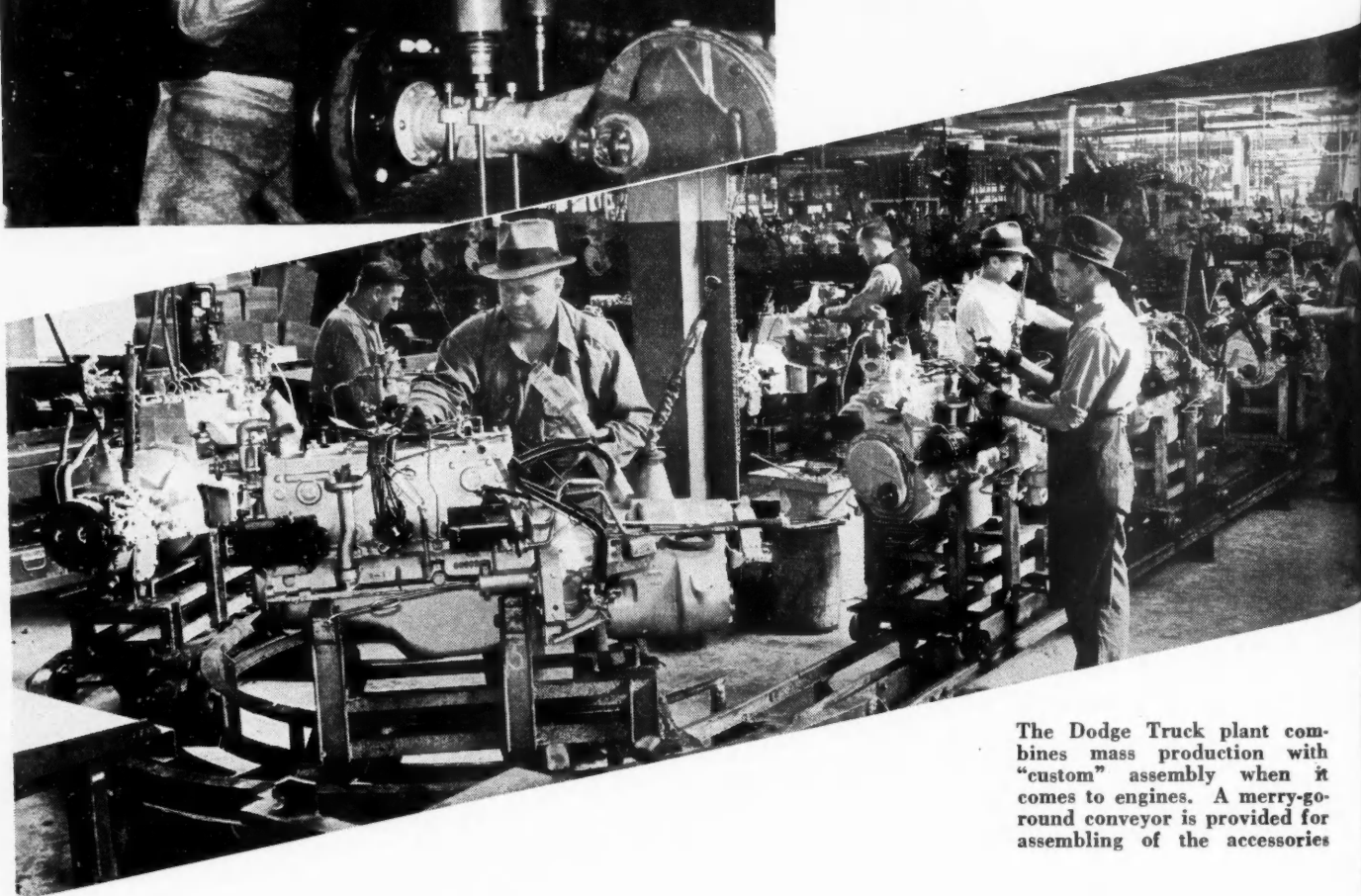
But fundamentally, he said, the banks have been driven into the retail financing business by the deficit financing policy of the U. S. Treasury, which offers new securities at low rates in order not to disturb any more than necessary the market position of previous issues, or to prevent the flow of capital from industrial bond issues.

So the banks are faced with mounting funds for investment, and unless the finance companies mend their ways, will take a lion's share of the best financing business, Mr. Coons warned. And, as was pointed out earlier, this may have a widespread effect on the retail automobile business.

HERBERT HOSKING.



(Upper Left) Here a high-cycle power wrench is supported from a telescoping torque arm which takes up the shock at the end of the tightening operations for spring U-bolts



The Dodge Truck plant combines mass production with "custom" assembly when it comes to engines. A merry-go-round conveyor is provided for assembling of the accessories

BY JOSEPH GESCHELIN
COINCIDENT with the opening of the National Truck Show in New York, November last, J. D. Burke, director of Dodge Truck sales, announced three striking developments bearing largely on the subject matter of this article. First was the completion of the mammoth Dodge truck factory—

latest and most modern in the industry. Next was the announcement of the 1939 line of motor trucks ranging from half-ton commercial vehicles to rugged three-ton trucks. And finally, the introduction of the Dodge Diesel engine.

As part of a six-million dollar truck manufacturing and sales program launched by the Dodge di-

vision, Chrysler Corp., the truck plant was planned and erected by Albert Kahn, in collaboration with the Corporation's production and engineering executives. The structure itself symbolizes a new note in industrial building construction—the bent-beam, monitor type design, pioneered by the Kahn organization. By the complete elimination of roof

Spent \$6,000,000

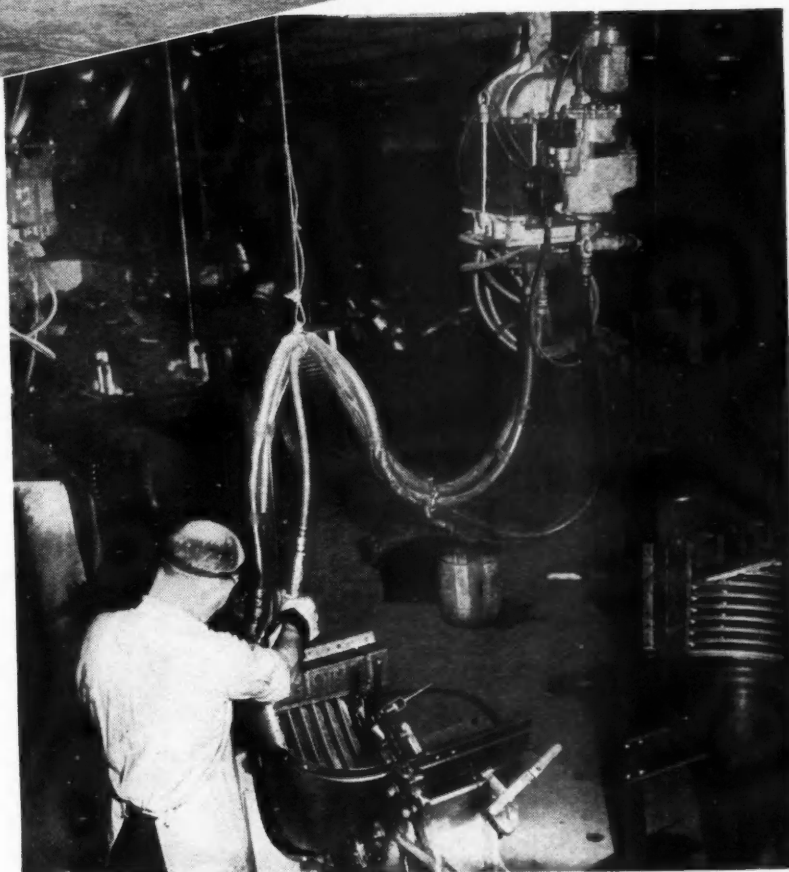
a Model Truck Plant



(Above) This photograph shows the area at the end of the final o.k. lines and the birth of several 1939 Dodge trucks

(Lower Right) Some forty individual hydraulic spot welding units are located in the welding department. Most of the welding guns are operated through air-hydraulic boosters. The picture above shows assembly of the radiator shell.

trusses, by the use of simple beams extending right up to the roof beams, inherent in this design, it provides vast open spaces, excellent daylight illumination, good ventilation and clean air afforded by the high vaulted work areas.



This great plant occupies 49 acres of ground located northwest of Detroit on Mound and Eight-Mile Road in Macomb County. It has a total floor space of 693,163 square feet and a normal capacity of 700 trucks per day. The main building 1260

adopted a method of cold-riveting throughout the truck structure, using hydraulic squeezers which do their work rapidly without the deafening clatter so familiar in the riveting operations of but a few years ago.

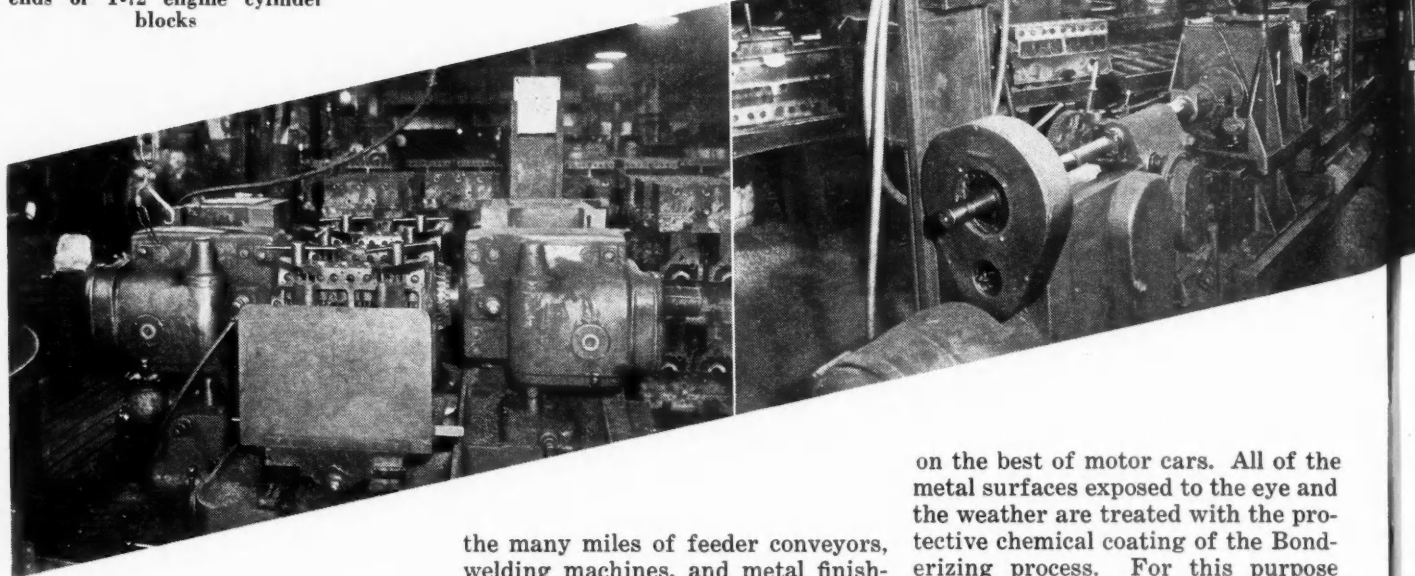
To production men everywhere this newest of truck plants represents the sum total of modern production lore and efficient plant layout. Its conception has drawn on the talents of equipment builders in the development of assembly lines.

proper sphere in the production of the Dodge safety steel cabs and bodies. Several Hydromatic welding machines, are found here; and a large variety of portable resistance gun welders.

Today the quality of the motor truck paint job and all of the metal finish associated with high quality are at least equal to that demanded

24. (Right) This set-up is used for the line boring of cam and crank bores on the gasoline engine cylinder blocks

25. (Left) Duplex milling machine set up for finishing both ends of T-72 engine cylinder blocks



feet in length, 400 feet in width and supplemented by an export building 120 x 240 feet, in which all foreign shipments are prepared.

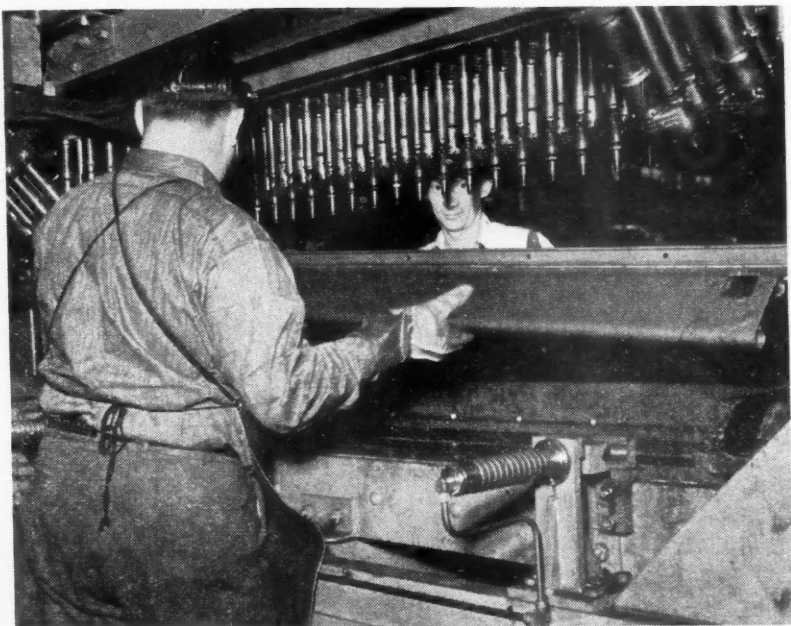
Comfort of the workers has been given particular attention. Witness the modern washrooms and toilet facilities; daylight and artificial illumination; a complete hospital equipped even for major operations; fully enclosed receiving and loading platforms affording protection both to workers and product. On the mechanical side there is a veritable maze of materials handling conveyors of every description, designed to effect the most efficient distribution. Too, the management has

the many miles of feeder conveyors, welding machines, and metal finishing equipment.

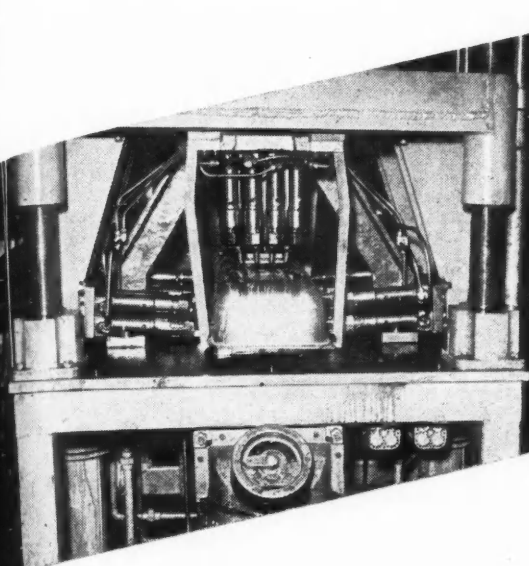
Welding techniques of all the familiar types—the oxy-acetylene torch, the electric arc, resistance welding—all are impressed in their

on the best of motor cars. All of the metal surfaces exposed to the eye and the weather are treated with the protective chemical coating of the Bonderizing process. For this purpose there are three large Bonderizing installations—one is a huge unit for finishing complete cabs and bodies; the other a smaller unit for finishing sheet metal, and a third unit for ex-

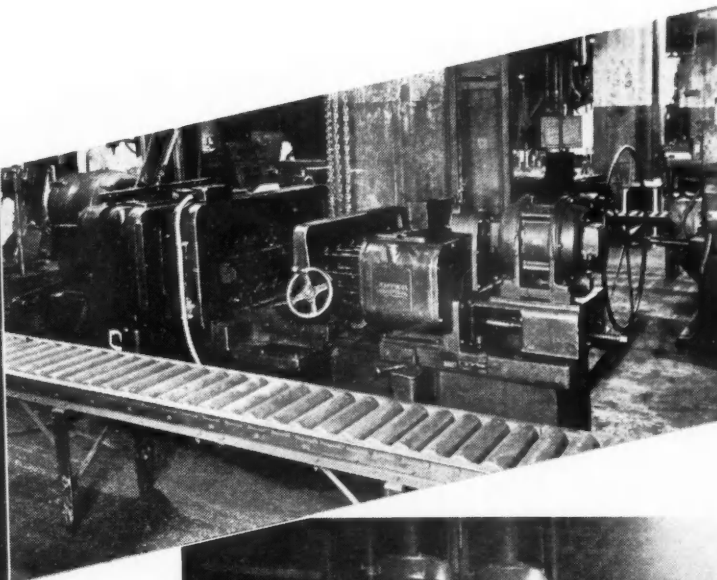
Hydraulic spot welding predominates on many operations, the machine shown above makes 74 spot welds in less than 30 seconds. The machine is designed to handle right and left-hand panels interchangeably and is adaptable for taking care of the various lengths of panels for different bodies



press boxes, cowls, and windshields. The second floor gallery paint department boasts one of the largest and certainly the most modern of the



(Left) This machine performs the hydro-matic welding of gas tank baffle plates. It is an automatic operation with 28 welds in one setting



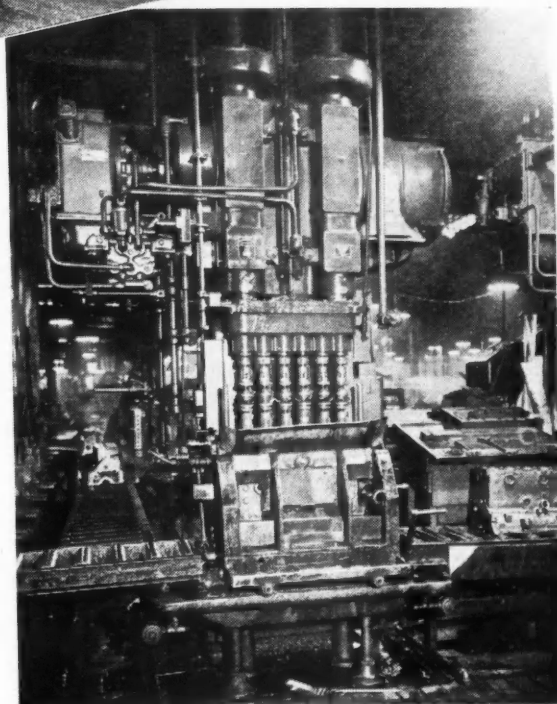
(Upper Right) One of the special multiple spindle drilling machines used on the diesel cylinder block line

three-coat, A-type high bake enameling equipment installations to be found in the industry.

Every paint spray booth in the plant is of the water wash curtain type. Not only does this type of spray booth promote better quality and less equipment maintenance but also it permits the ready collection and salvage of valuable overspray.

In keeping with the tenor of modernity in this plant, the layout comprehends the most efficient distribu-

(Right) Six-spindle honing machine is used for honing cylinder bores on the T-72 gasoline engine block



Connecting Rod Routing

Dodge Diesel Engine

OPERATION

Disc grind crank end
Straighten
Drill wrist pin hole
Countersink wrist pin hole both sides
Rough ream wrist pin hole
Turn radius on outside diameter of bolt bosses
Mill joint face of rod and cap
Mill top of bolt bosses
Disc grind joint face of rod
Remove all burrs
Drill bolt holes in rod and cap
Countersink bolt holes in rod
Ream bolt holes in rod and cap
Mill lock groove in rod and cap
Spot drill with $\frac{1}{4}$ -in. drill in rod
Remove burrs from rod and cap
Assemble cap to rod with bolts and nuts
Rough bore crank end and semi-finish bore crank end
Chamfer both sides of large bore

OPERATION

Finish ream wrist pin hole
Spot drill oil hole $\frac{3}{16}$ -in. and drill $\frac{1}{16}$ -in through to bore
Finish chamfer both sides of crank end
Check for twist and parallelism
Semi-finish and finish bore crank end to 2.6464-2.467
Finish turn outside diameter bolt bosses
Disc grind sides of cap to 1.636-1.642 in.
Turn outside diameter of bolt bosses to 3.637-3.639 in.
Disc grind joint face
Counterbore bolt holes and spotface
Press bushing in place and burnish
Saw $\frac{3}{16}$ in. slot in piston pin end
Chamfer both sides of bushing
Rough ream bushing to 1.113-1.114 in.
Grind both sides of crankshaft end of rod and grind crank pin hole
Diamond bore piston pin bushing
Inspect

tion and storage of incoming raw and finished materials. For this purpose there are three different receiving bays, each located strategically with respect to points of immediate usage.

Quality control dominates the production scene. The two main assembly lines terminate in four separate final O.K. lines, each with its own set of chassis rolls for checking the running gear. To supplement natural light, some seventy high powered lamps provide daylight seeing

gallery with its activity will be taken up later.

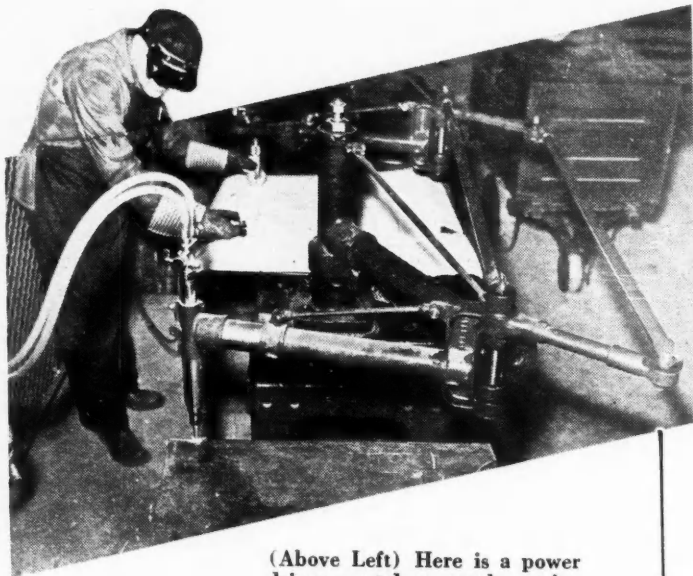
In the mental picture, we may consider the main floor as being divided roughly into three sections running longitudinally. The first of these, as we enter the building, is composed of the two final assembly lines, with their feeder sub-assembly stations, terminating at the entrance in four parallel O.K. lines.

The center section, running back approximately half the length of the building, contains the body and cab

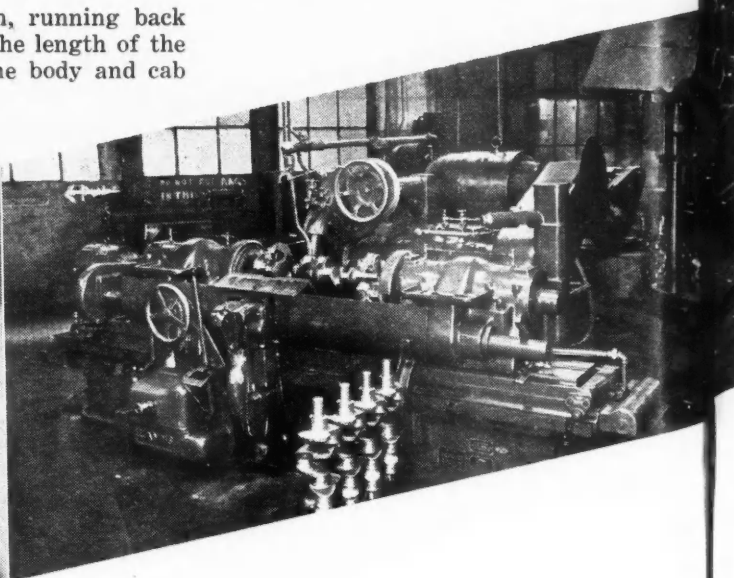
trim department, trim shop, body storage tracks from which the bodies are scheduled to the assembly lines, body schedule conveyors, and body delivery cranes.

The outer section is devoted, in the main, to body assembly at its far end and two long metal finish lines terminating at the front end.

Examination of a small-scale floor



(Above Left) Here is a power driven acetylene torch cutting machine for sawing steel plates, boiler plates, etc. Operating on the same principle as a pantograph, it leaves a smooth line even in the most intricate patterns. Machining is entirely eliminated with the use of this device.



(Above right) One of battery of new hydraulic plain grinders for finish grinding crank pins.

for the minute inspection of the finish.

Due to the detail embodied in the assembly plant, this article must of necessity confine itself to a coverage of the high spots. To round out the discussion we also have included something on the production of one of the more popular gasoline engines used in Dodge trucks; also the first description of the production set-up for the new Dodge Diesel.

Plant Layout—Main Floor

To capture a perspective of the truck plant, visualize, if you will, this vast expanse of floor space offering an uninterrupted view of the entire operation. The second floor

OPERATION

Blowout and spray with lacquer in crankcase valve opening and oil vent cavity
 Rough and finish mill bottom, rough and semi-finish mill top. Finish mill valve side. Rough and semi-finish mill width and finish mill bottom of bearing cap grooves and mill oil pump boss
 Drill chamfer and ream two locating holes in bottom side. Chamfers being made with air motor after part is removed from fixture
 Rough and semi-finish mill ends
 Mill fuel pump boss
 Mill two generator bosses and one boss on distributor side
 Rough bore piston bores
 Finish bore piston bores
 Drill and core drill the following holes—10 in top face, 2 in front end, 1 in rear end, 10 in valve side
 Drill 12 valve stem guide holes
 Core drill 2 intermediate camshaft holes, check wall for clearance below piston bores and grind projection
 Rough bore crankshaft bores and semi-finish bore camshaft bores
 Straddle mill crankshaft bearing faces and rough mill oil slinger groove, leaving 1/32 in. stock in No. 4 rear mainbearing faces for finish later in cylinder block and caps. Assemble and rough mill 2-11/16 in. clearance dia.
 Chamfer lower end of piston bores from bottom side and grind clearance
 Drill 12 valve tappet holes from bottom and drill (1) 1/4 in. oil drain hole into oil regulator holes
 Chamfer lower end of 12 valves tappet holes
 Counterbore underside of 12 valve stem guide holes
 Rough ream 12 valve stem guide and tappet holes
 Semi-finish ream 12 valve stem guide and tappet holes and finish form throat in valve port holes
 Chamfer top of 12 valve tappet holes
 Drill 9/32 in. oil supply line holes from both ends
 Drill 8 holes in top face, 22 in valve side, 18 in front end, 12 in rear end
 Drill 48 holes in bottom side, 13 in distributor side
 Drill 12 holes at 30 deg. angle into tappet bosses on valve side
 Rough 6 exhaust valve seat insert counterbores and ream one oil filler hole

(Right) View of one of the new projection welders for gas tanks, welding nuts in the end of the seam, thus making end supports and tank one piece.

(Left) 10 x 50 plain grinder is used for rough grinding crankshaft rear main bearing

T-72 Cylinder Block Routing

Dodge Truck Engine

OPERATION

Finish line ream valve stem guide and tappet holes
Press $\frac{5}{8}$ in. ball thru 12 valve tappet holes
Inspect
Chamfer all tapped holes in sides and both ends and 1 pipe tap drill hole above oil regulator hole
Chamfer 2 tap drill holes in top
Chamfer 21 tap drill holes in top. Finish drill balance of hole in bottom thru to oil supply line hole
Counterbore and chamfer 8 main bearing cap stud holes to $\frac{33}{64}$ in. dia. and chamfer 23 holes
Tap 33 holes, tap 17 holes in front end, tap 6 holes in rear end
Tap 2 holes in top face, 20 in valve side, 8 in distribution side
Drill counterbore and spotface distributor hole and step drill hole for tap hole in boss below distributor hole. Drill oil pump hole and chamfer same.
Counterdrill two tap drill holes for tap in oil pump pad and drill one hole at 35 deg. through rear cam bearing to oil pocket
Spotface and counterbore distributor hole
Spotface hole below distributor hole. Drill 1 oil hole at 30 deg. angle into front camshaft and tap 1 hole on bearing and 2 tap drill holes in oil pump pad with air motor
Tap 2 holes in oil pump pad top side of oil regulator hole
Press 12 valve stem guides into cylinder block
Rough ream piston bores 6 passes
Finish ream piston bores 6 passes
Rough lap piston bores
Finish lap piston bores
Clean carborundum from piston press with rotary brush
Water Test

OPERATION

Blow out water from piston bores and cylinder head stud holes
Inspect and stamp sizes of piston bores
Start drill oil holes and air test oil lines
Finish drill balance of 4 oil line hole on distributor side into camshaft bore, finish drill oil regulator hole into oil line, drill angular hole into distributor hole and blow out chips from these and from main bearing holes
Finish tap cylinder head stud holes in top
Finish mill bearing cap grooves for width only
Mill anchor grooves in main bearings and groove in No. 4 Main bearing
Finish tap 8 main bearing cap stud holes
Wash and blow water from brg. cap stud hole
Assemble bearing cap studs to cylinder block and tighten with air motor
Assemble bearing caps to cylinder block with temporary washers and nuts
Finish bore camshaft and crankshaft bores leaving all cam and crankshaft bores .005 undersize
Semi-finish and finish line ream crankshaft bearing bores
Finish line ream all four camshaft bearing bores at one pass
Inspect 100%
Finish ream distributor hole and oil pump hole, and chamfer oil pump holes
Finish face mill oil pump boss piloting from finish reamed crank and camshaft bores
Ream dowel holes in rear, ream two dowel holes in front end and ream one oil regulator hole in distributor side
Finish straddle mill thrust faces on rear main bearings, mill $\frac{3}{8}$ in. clearance dia. Blow out main oil line and line ream main bearings to remove burrs by hand. Also mill and chamfer $2\frac{11}{16}$ in. clearance dia. to size
Finish mill rear and front ends
Load camshaft bushing on arbor, load cylinder on fixture. Press bushings into cylinder. Drill 3 holes in bushing. Stake 3 bushings and unload cylinder
Bore three camshaft bearing bushings locating from rear No. 4 camshaft bore and front No. 1 crankshaft bore, wash in dipping tank to remove oil and chips
Finish mill top face
Semi-finish ream intake and exhaust valve stem guide holes
Finish ream intake valve port holes and semi-rough ream, exhaust valve seat insert counterbore for dia. and depth
Finish ream intake and exhaust valve stem guide holes
Rough seat 6 intake valve seats
Semi-finish ream 6 exhaust valve insert counterbore and to finish depth 6 passes
Finish ream 6 exhaust valve seat counterbore
Assemble exhaust valve seat inserts into cylinder block by hand
Grind all exhaust valve seats in inserts and all intake seats in block. Check seats for concentricity with valve stem guide holes
Inspect

layout reveals the skill with which the floor plan was conceived and executed. Here is an operation that must handle according to sales department releases, a complex variety of commercial vehicles ranging from half-ton commercial cars to three-ton trucks, some of which may be six-wheelers. Add to this the many specification variations—special equipment, engines and accessories, special cabs, special bodies, varying lengths due to wheelbase options, color, and all the rest.

To reduce the complications to their simplest terms, the product is arbitrarily divided into two categories—light vehicles, heavy-duty models. Thus two final assembly lines—one for each type. Similarly the bodies are handled on two different lines in each department—a cab

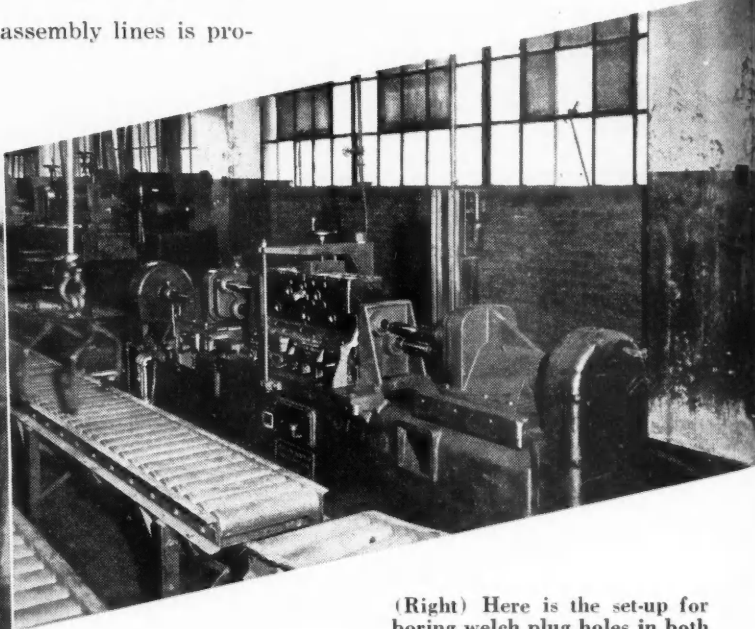
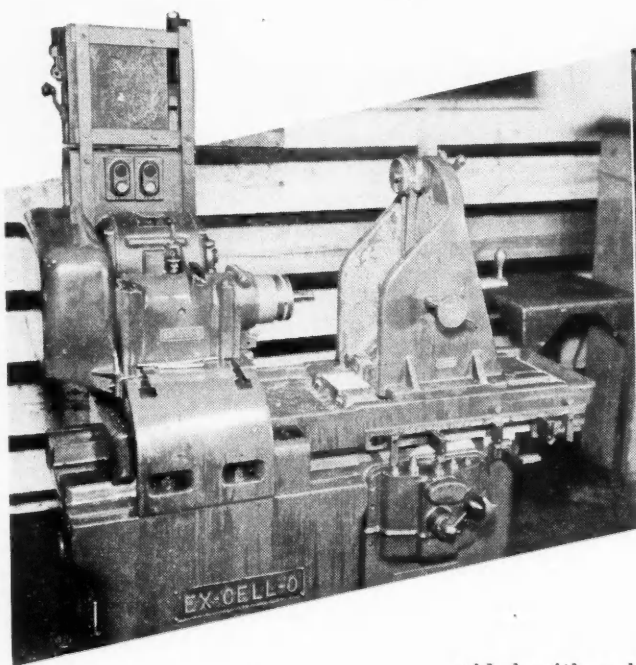
assembly stations at points of usage—wheel and tire assembly, rear axle assembly, radiator and grille assembly, front end sheet metal assembly unit, engine preparation, etc. Here will be found the neat little department producing gas tanks. The tanks are made up of two stampings, seam-welded on a battery of new seam-welding machines.

It is of interest to note that high-cycle electric portable tools are used exclusively for the assembly of fastenings. Important new development along this line is the use of a special torque arm on tools for heavy fastenings for the axle and springs. The torque arm suspends the tools on a telescoping beam of heavy rectangular cross-section, thus eliminating torque shock.

Each of the assembly lines is pro-

At about the mid-point of each assembly line is the body delivery station, bodies being transported by a traveling crane on an overhead rail. The forward section of each assembly line is provided with clean, well-lighted pits which permit the operators to gain easy access to all under-floor fastenings.

Finally, the finished vehicles come off the lines and are distributed to one of the four final O.K. lines. Here they are painstakingly inspected, run-in on the chassis rolls, given the final touches, including headlamp adjustment, and are ready to go to work. Finished trucks leave the plant by way of one of three routes—by



(Right) Here is the set-up for boring welch plug holes in both ends of the Diesel cylinder block.

(Left) Precision boring machine is used for diamond boring of the wrist pin bushing in the Diesel connecting rod

line, and panel body line.

The two assembly lines start at the far end of the building, served by a receiving bay that brings in engines, frames, wheels and tires, chassis parts. Both lines parallel physically as well as in activity, although each exhibits some difference due to differences in size. For example, on initial frame assembly operations, the light-duty line carries the frames cross-wise on the conveyor so as to conserve space, the frames being inverted and turned endwise for final operations. On the heavy-duty line, the frames are so long that they are started endwise of the conveyor and simply turned over.

Each of the lines is served by sub-

vided with a built-in chassis spray booth, with a booth and operator for each side of the frame. Upon emerging from the spray booths, the chassis pass through a built-in drying oven on each line. The latter are of A-type construction for two good reasons. First, the A-type oven gives a longer travel within a limited longitudinal space, and secondly, the raised center section produces an elegant arched passageway.

In this same vicinity will be found a small department devoted to the finishing of wheels. Traveling on an overhead conveyor directly from the receiving platform, wheels are washed, dried, sprayed, baked, then transported to the wheel and tire assembly, preparatory for delivery to the assembly lines according to schedule.

rail or drive-away for domestic orders; to the export building for crating or rail delivery.

We can skip mentally to the other outermost section where bodies originate. At the far end are received the various stampings for all-steel cabs, panel bodies, pick-ups, etc. Bodies are built into integral structures by various welding techniques, using the torch, electric arc, resistance welding. Several large welders are employed for making up sub-assembly units. Many operations are handled with portable gun welders with transformers mounted overhead.

The sub-assemblies then are transported to the huge framing jigs where the complete unit is made up according to exact specifications as to size and alignment. There are two of these major jigs for cabs; two for panel bodies.

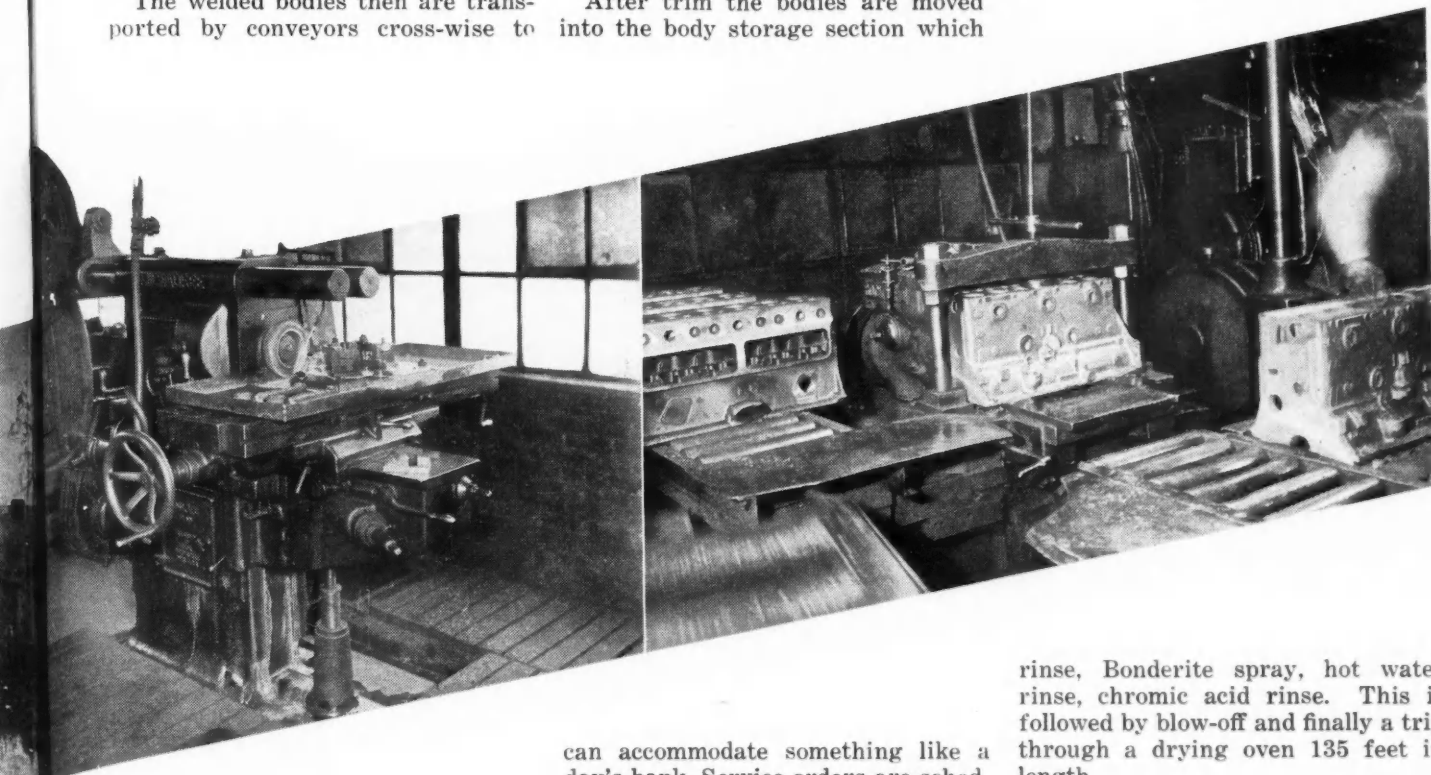
The welded bodies then are transported by conveyors cross-wise to

can describe. One of the conveyor lines handles the cab backs and seats, built in pairs. The other takes bucket seats and seat backs. In the latter case, the units are made up in pairs, assembled at the end of the line, and then riveted together.

After trim the bodies are moved into the body storage section which

(Left) Milling tops of bolt bosses on the diesel connecting rod

(Right) This view shows the finish milling of fuel pump pad on the T-72 cylinder block



the body finish lines. These are long conveyors accommodating all of the preparatory metal finish work.

Emerging from the metal finish lines, the bodies take an escalator to the second floor gallery for metal cleaning, rust-proofing, and paint.

Since we are still on the main floor, let us assume for the moment that the bodies in white have gone up to the paint shop and after paint return down a ramp to the main floor. Painted bodies then are scheduled on the trim lines where they are fitted with hardware, trim, accessories, etc., according to order.

Interesting spot in this department is the compact trim shop with its sewing machines and cushion assembly. Even here, you will find two sewing machine sections and two separate cushion departments, serving two separate trim lines. The trim department is encircled by a unique basket conveyor line with trays large enough to accommodate a complete trim assembly.

Cushion assembly conveyors are quite different from the familiar rail type extant in the industry. The illustration in the pictorial section will show this much better than we

can accommodate something like a day's bank. Service orders are scheduled to the final assembly lines, hourly, the proper bodies being singled out of the bank and transported by crane on to one of two platform conveyors, in readiness for installation. They are lined up in order and carried to the assembly line on one of two body cranes—special one-ton trolley units.

While the foregoing by no means covers every activity on the main floor, it does high-spot most of the principal activities so that the reader can visualize the general plan. The scene now shifts to the second floor gallery which houses the major part of metal cleaning, rust-proofing, and paint.

Second Floor—Main Building

Here we find a deck running the full length of the building, about half its width, extending over the trim lines. The forward half of the department is exclusively for bodies, the rear half takes the small parts sheet metal.

You will recall that bodies in white come up the escalator from the metal finish lines. They are spot-cleaned and proceed immediately to the huge Bonderizing machine unit comprising six separate stations—hot alkali wash, hot water rinse, hot water

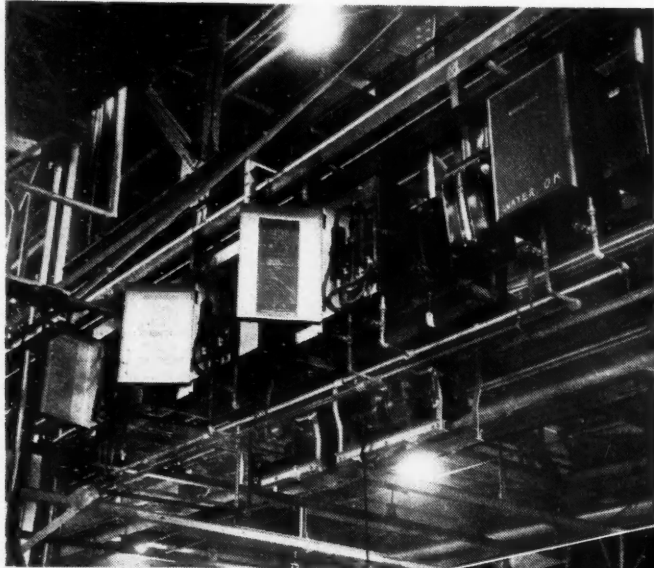
rinse, Bonderite spray, hot water rinse, chromic acid rinse. This is followed by blow-off and finally a trip through a drying oven 135 feet in length.

After leaving the drying oven the bodies progress through the spray booths for under coats, loop back on the floor conveyor through the long drying ovens which carry the work to a conveyor loop at the extreme forward end about at the entrance to the Bonderizing unit. Then follow the wet sand deck, drying oven, and spot spray.

Bodies now are ready for the finishing operations which take place in the second section of forward end of the paint shop. It is of interest to note that the entire finish unit is completely glass-enclosed and air-conditioned to assure perfection of quality, freedom from dust, temperature and humidity effects.

It is difficult to describe the skill with which the layout of the paint shop has been developed. Suffice it to say that every advantage has been taken of the floor space by arranging the operations in parallel rows, carrying work on conveyor lines which loop continually at their ends. In effect the developed length of the conveyor lines provides all of the space and time cycle required to traverse the spray booths, ovens and other equipment.

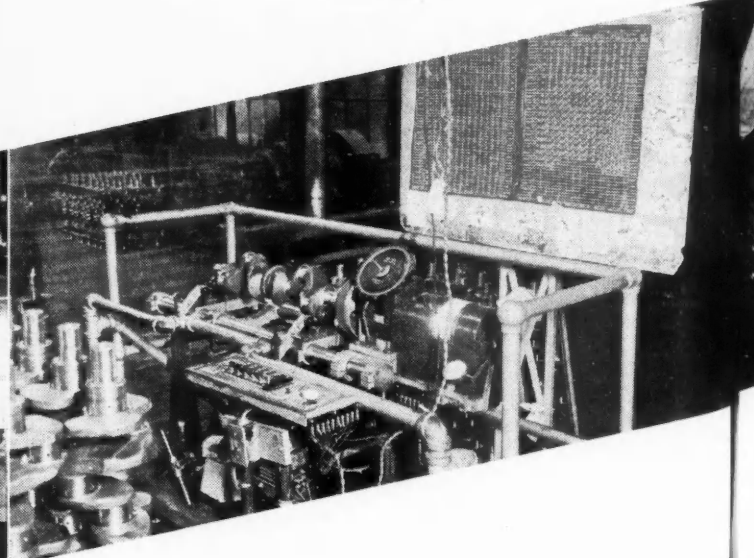
Compressed into the rear section of the paint shop is the manifold



(Left) The Dodge Truck Plant is said to be the nation's first large plant to be completely equipped with electronic tube contactors for welding. These water cooled mercury vapor vacuum tubes eliminate the high starting currents through transformers by cutting in on the peaks of the voltage waves

(Below left) Traveling overhead cranes for body drops carry both body and cab on the same hoist and drop them at the same time on the chassis

(Right) New type electric balancing machine is used in checking dynamic balance of crankshafts



T-72 Crankshaft Routing

Dodge Truck Engine

OPERATION

Center both ends
Mill locating pads at throw arms
Rough turn and cheek no. 1-2-3-4 main bearings. Rough turn gear and pulley fit, rough face front end of No. 1 main bearing and chamfer and face front end of shaft, rough form oil retainer, and oil slinger. Rough straddle face flanges and bolt ring diameters
Straighten
Rough grind No. 2 and No. 3 main bearings
Finish turn and fillet No. 4 (rear) main bearing. Finish face outside face of flange. Turn and form oil retainer groove. Turn and chamfer outside diameter of oil slinger
Rough grind width rear main bearings
Rough grind outside diameter rear main bearing
Finish turn front bearing and gear and pulley fits dia. and face No. 1 bearing gear fit shoulder
Cheek throw arms at all pins
Rough turn all 6 pins at one time
Drill (6) $\frac{1}{4}$ in. oil holes from crank pins to all main bearings
Straighten
Finish turn all six pins
File burrs from the pins and peen ends of oil holes
Drill 27/32 in. clearance hole in flange
Rough counterbore 3-1/16 in. dia. in face of flange
Face front end of shaft No. 1 bearing. Drill counterbore and tap hole in end
Drill and counterbore 0.937 in. hole, turn bolt ring face back of flange
Straighten

OPERATION

Finish grind No. 2 and No. 3 intermediate main bearings
Finish grind width No. 1 main bearing
Finish grind width No. 4 main bearing
Finish grind outside diameter No. 4 main bearings
Finish grind six crank pins
Straighten
Finish grind outside diameter of flange
Finish grind oil retaining groove dia.
Finish grind gear and pulley fits to size
Drill 4 holes in flange
Chamfer 4 holes in flange
Ream 4 holes in flange
Finish bore, ream hole in flange. Press in bushing and burnish hole to size
Mill letter "A" Woodruff Keyway
Mill straight keyway
Straighten
Finish grind face of flange
Rough balance
Drill for rough balance
Drill hole in opposite side
Polish walls to No. 1 and No. 4 main bearing and remove chips from oil holes with magnetized rod. File sharp corners and peen oil holes
Finish balance
Drill for finish balance
Finish straighten
Check for balance
Lap all main and pin bearing, gage, and check crankshaft before sending to inspection
Flush all oil holes with kerosene
Hang on conveyor and send through washing machine

(Top right) Seat cushion assembly has been worked out in a neat progressive fashion at the Dodge truck plant. All the parts travel on a cradle on an overhead conveyor. As padding, leather covering, etc., are put in place, springs are compressed with the simple jack-clamp shown here to enable completion of assembly. A similar line is provided for bucket seats



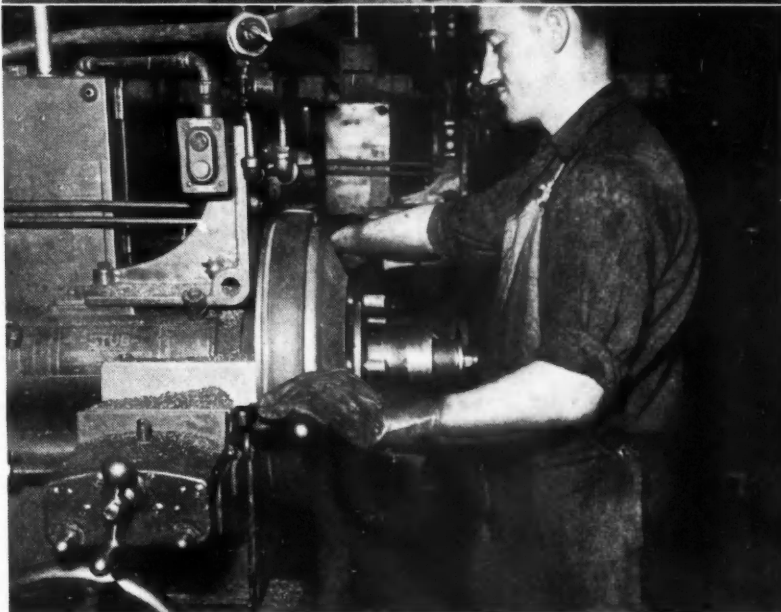
(Above left) Interesting is the method of assembling inner steel framing for panel trucks. The five side posts and the cross members are shown as they are assembled, first, in a jig for accurate locating. The entire assembly is then welded together in accurate alignment with light weight guns. Note that padding is already in place on ribs

(Right) One of a number of portable hydraulic riveters on the assembly line, capable of pressures up to 35 tons. Light in weight, silent in operation, they squeeze tight rivets up to $\frac{1}{2}$ in. diameter or better. Here is shown the riveting of brake support assemblies onto rear axles



activity necessary for the finishing of the variety of sheet metal parts—fenders, hoods, radiator shells, etc. Prize exhibit here is the huge A-type, three-coat, high bake enamel unit for sheet metal parts. The unit is 320 feet in length, completely enclosed to assure perfection of quality.

A small Bonderizing unit, some 100 feet in length, is found in this



Among the interesting operations in the finish boring of brake drums. Note the rubber anti-chatter band around the drum which prevents chattering

section for the rust-proofing of all sheet metal parts.

As in the main section in body paint, there is a second section here, devoted to finishing operations of sheet metal parts in color. This, too, is glass-enclosed and air-conditioned.

It is important to note that all of the operations on the paint shop gallery are positively ventilated by a comprehensive exhaust system, and kept fresh and clean with fresh air drawn in from the outside, exhausted without recirculating. Only a personal visit to this department will enable one to appreciate how well the

atmosphere is maintained and how comfortable it is for those who work here.

Engine Production

To high-spot some of the major operations in the production of engines, we have selected one gasoline engine most widely used in the regular line of trucks. It is the Model T-72, for the $\frac{3}{4}$ -ton and 1-ton trucks.

Dodge builds six different sizes of engines to take care of its complete line of commercial vehicles and heavy-duty trucks.

To illustrate the manufacturing procedure in building the T-72 engine which will be found in keeping with advanced practices current in the passenger car industry, we have reproduced several factory routings. One of these shows the production of the cylinder block in all of its steps; the other gives the steps in the production of the crankshaft.

Every one of the engines is block tested and given careful final inspection before delivery to the truck assembly lines; and again inspected after assembly in the truck during the period of run-in on the chassis rolls.

The 3-ton gasoline engine, Model T-80, is 6-cyl., $3\frac{3}{4}$ in. bore x 5 in. stroke, 331 cu. in. displacement, rated 100 hp. at governed speed. Due to relatively moderate volume this engine is built in a special machine shop equipped with machines and tooling more suitable for small-lot manufacturing.

It is of great interest in this discussion to note that the new Dodge Diesel engine, Model T-84, has been so designed as to be interchangeable in mounting dimensions with the T-80 so as to fit the same chassis without change. From a production viewpoint, however, they have gone even further to effect interchangeability in the interest both of production economy and facility of service operations. Thus we were particularly impressed with the fact that dimensional interchangeability of certain major parts makes it feasible to build such parts over the same machine lines, using the equipment set-up for similar gasoline engine parts.

This is true of the cylinder block and the connecting rod. In fact, the interchangeability of connecting rods makes it possible to build into the gasoline engine the more rugged type of rod required in Diesel service.

It is a tribute to the skill of the Dodge production men, as well as to the flexibility of modern machine tools and their attachments that it is possible to run the Diesel block over the line designed for the gasoline block, considering certain detail differences in drilled and tapped holes, oil passages, etc. This is accomplished by "coasting" certain tools, made possible by the flexibility of drilling and tapping heads; by skipping certain machines entirely; by the use of single spindle operations for certain drilled and tapped holes. Even the boring and honing equipment affords sufficient flexibility to permit a quick change-over in stroke to accommodate the somewhat longer bore of the Diesel block. The fact

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that the Diesel block has more camshaft bearings makes no difference in the basic set-up since a simple change in the boring bars gives the desired result.

The Diesel piston is of special design, unlike any form used in gasoline practice, and is treated in different fashion.

While the Diesel crankshaft is run over the same machine line as the gasoline shaft, it, too, is handled with greatest economy by taking advantage of the flexibility of tooling of modern crankshaft equipment, combined with the skill of the tool engineers.

To high-spot some of the production features of the Diesel, we have reproduced the factory routings of the cylinder block, connecting rod, and piston, as typical of the operation.

Finally, it may be well to add that this article has been supplemented by a rather comprehensive pictorial section which tells the story much more eloquently than any word picture we can give you. Here you will find a variety of views so chosen as to present the most important high-spots in the truck plant. Here, too, will be found many illustrations of the equipment and procedures in the manufacture of such engine parts as have been mentioned immediately above.

A Proposed Test for Diesel Fuels

A PROPOSED Method of Test for Ignition Quality of Diesel Fuels has been released for publication by the Cooperative Fuel Research Committee, and copies can be had in pamphlet form from the American Society for Testing Materials, 260 So. Broad Street, Philadelphia, Pa.

The method provides for the use of the C.F.R. Diesel-fuel testing unit, which is a modification of the original C.F.R. test engine as built by Waukesha. A detailed description of this engine is given in the pamphlet. Accessories to be used include an oil heater and thermometer, air-heater and thermometer, water heater and thermometer, and a Bosch injection pump and injector.

The ignition quality is to be measured by the coincident-flash, fixed-delay method, using neon lights which are located on the periphery of the flywheel and are operated by contact points on the combustion and injection indicators. The necessary instrumentation consists of the following parts:

1. The combustion indicator, which mounts in a tapered hole ($\frac{7}{8}$ in.-18 thread) in the combustion chamber and is equipped with a spring-steel indicator diaphragm 0.543 ± 0.003 in. in diameter and 0.015 ± 0.0005 in. in thickness. The contact points are mounted on bronze leaf springs 0.021 ± 0.0005 in. in thickness. Graduated spring-tension adjusting screws are provided. In addition, a graduated gap-adjusting screw is provided with a spring-cushion plunger to protect the contact points against overloading as a result of combustion pressures.

2. The injection indicator, which utilizes contact-point assembly parts similar to those of the combustion indicator, with brackets for attachment to permit operation of the contact points by movement of the injector valve.

3. The neon-light mount, which carries two $\frac{1}{2}$ -watt, 110-volt neon bulbs located behind an aperture plate with 13-deg. spacing between openings.

4. The sight-tube and top dead center reference mark with brackets.

5. Flywheel slip rings and brush holders with necessary brackets and

SURE-FIRE ASSEMBLY CONTROL

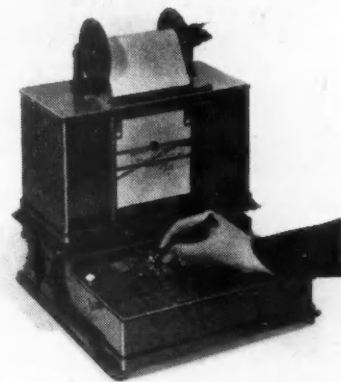
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wiring for the neon-light support.

6. A 100-volt d.c. generator to supply current for the injection and combustion indicators. This is belt-driven from the power-absorbing unit. The voltage is controlled to 115 ± 5 volts by means of a field rheostat located on the instrument panel.

Detailed instructions are given in the pamphlet as to starting and stopping the engine, checking the injection pump for port closing, injection-pressure setting, injection-indicator contact setting, combus-

tion-indicator contact setting, and final combustion-indicator contact setting. The method of rating a fuel is as follows:

The injection is set to the rating position of 13 deg. before top center, which makes the injection flash appear in top center. The final compression ratio is adjusted so as to give coincidence of injection and combustion neon flashes. The combustion-chamber length is then recorded. It is advisable to check the combustion contact point setting by changing the injection timing and

observing whether the combustion and injection flashes move and are still coincident. If they are, the setting is correct.

From the combustion-chamber length recorded when the sample fuel has been adjusted to operate under standard conditions with 13-deg. delay period, the cetane number of the unknown sample is estimated, and two reference-fuel blends are then selected which differ by not more than eight cetane numbers and bracket the unknown sample. When reference fuels have been found which have a longer and shorter delay period, respectively, than the sample, by adjustment of the combustion-chamber length alternate readings are taken until the neon flashes coincide at top dead center. Alternate readings between the sample and reference fuels are taken in the following order: Sample, reference fuel No. 1, reference fuel No. 2, sample, reference fuel No. 1, reference fuel No. 2. After changing from one fuel to another, 5 min. is allowed before taking a reading, to insure complete flushing of the injection system.

The cetane number of the fuel is determined by interpolation from the average combustion-chamber lengths so found. The cetane number is given as the nearest whole number to the value arrived at by interpolation. If the value obtained falls exactly midway between two whole numbers, the nearest even number is used.

1938 Reductions Put Citroen in Lead

CITROEN is reported to have resumed its position as the largest automobile producer in France, having turned out approximately 70,000 cars during the past year, which is nearly one-half of the total number sold in France during the year. Citroen's "comeback" is supposed to have resulted in part at least from price reductions, the 7-horsepower having been reduced from 25,900 to 24,700, and the 11-horsepower from 29,500 to 27,700 francs.

IT is reported that the Brazilian Government is pushing the development of motor trucks operating on producer gas and is contemplating the organization of a competition for motor vehicles manufactured (this probably means assembled) in the country and running on gas.



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